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Pacific Marine Review

The National Magazine of Shipping

January, 1927

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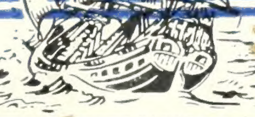

Official Organ
PACIFIC AMERICAN
STEAMSHIP ASSOCIATION

Official Organ
SHIPOWNERS' ASSOCIATION
OF THE PACIFIC COAST

Pacific Marine Review, Vol. 24, No. 1, Published Monthly at San Francisco. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. $2.00 a year.

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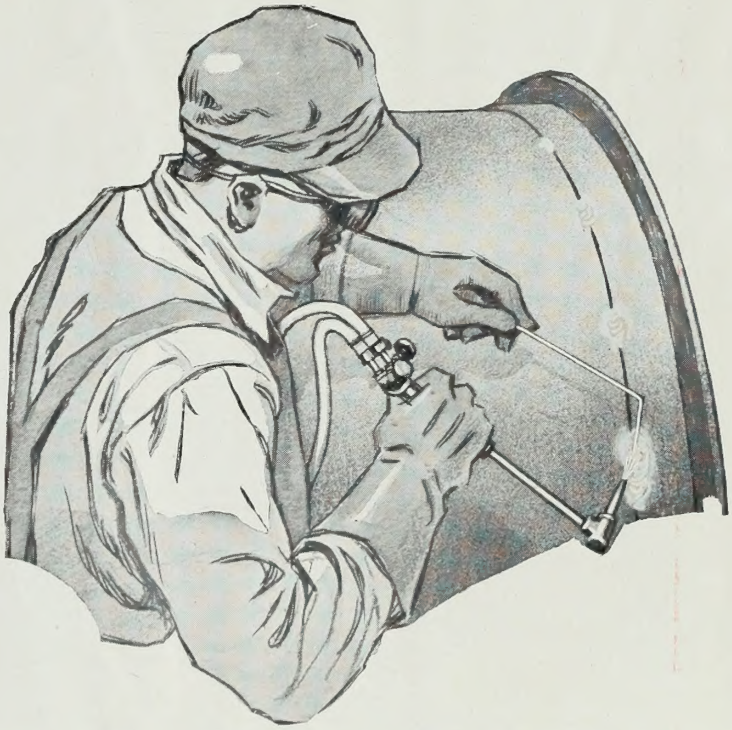


LINDE OXYGEN

Pacific Marine Review

CONTENTS

January, 1927

Frontispiece ..... 11 Adv.

Editorials 1
Marine Safety First; The Double-Acting Diesel; Marine Engine Ad Copy; Shipping Board Sales.

Pacific Shipping Leadership 3

Future of Pacific Commerce, by Robert Dollar 4

The Pacific Coast Lumber Schooner, by Ralph W. Myers 6
A sketchy account of the development of the coastwise lumber carriers serving Pacific ports.

Cooperative Employment Service 10

Pacific Coast Oil Tankers, by J. C. Rohlfs 12

The South Pacific. Special Correspondence 17

Red Stacks, Black Stacks, and Griff's 18
The Story of Pacific Coast Towboating.

The Significance of Cooperative Effort, by Norman F. Titus 22
An enlarged opportunity for maritime prosperity on the Pacific Coast.

The Pacific "All Americans," by James A. Quinby 24
Some observations on the development of marine insurance in San Francisco.

The Sewall "Big Four," by F. C. Matthews 28

America Needs Naval Reserve 30

World's Exports for 1925 31
Compilation by National Foreign Trade Council shows foreign trade at par.

Auxiliaries, Ship Supplies, Marine Equipment:

- Cunningham Electric Auxiliaries 33
- 85 Per Cent Magnesia 34
- Marshall-Newell Marine Hardware 35
- Electrical Firm Busy 35
- Rushing Work on the Malolo 36
- McEverlast Paint—A California Product 37
- Haskelite and Plymetl Active in Shipbuilding During 1926 37
- Large Order for Maxim Silencers 37
- Complete Cory Communication 39
- Rivet Trouble in Tank Steamers 39
- Gasoline Proof Packing 41
- Powell Valves 41

Westinghouse Marine Electrical Installations in 1926, by W. H. Cope 38

Electric Developments in the Marine Field in 1926 as Measured by General Electric Company's Installation, by D. W. Niven 40

Marine Insurance 43

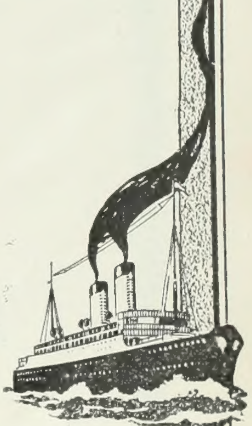
American Shipbuilding 50

Who's Who Afloat and Ashore ..... 13 Adv.

Directory of Intercoastal, Offshore, and Coastwise Lines Serving Pacific Coast Ports ..... 15 Adv.

Of a General Nature:

The Export Triumvirate, 17; Trade Literature, 32, 33, 34, 38, 39, 40, 48, 49; Some Recent Union Installations 41; Washington-Estep Progress, 41; Colo Diesel, 42; Largest Pacific Coast Fishing Boat, 42; Handy Valve Tool, 42.



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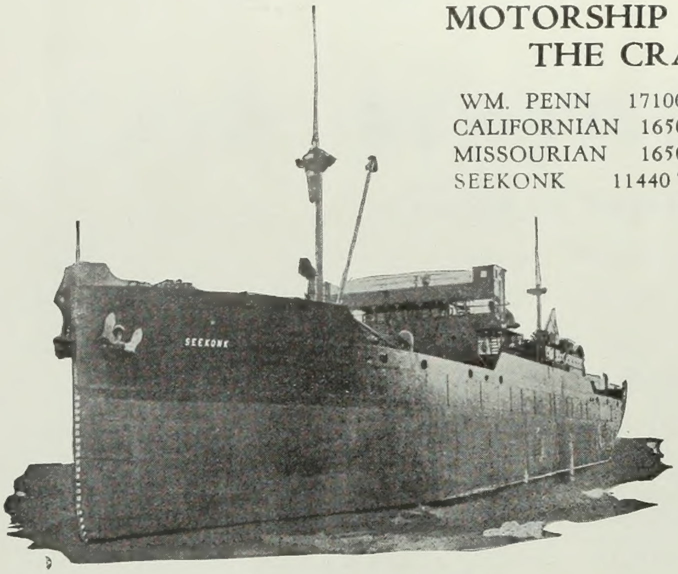

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THE FUEL CONSUMPTION OF THE STEAMERS, AT ONE-QUARTER KNOT HIGHER AVERAGE SPEED.

ONE TENTH

THE FUEL CONSUMPTION IN PORT OF THE STEAMERS.

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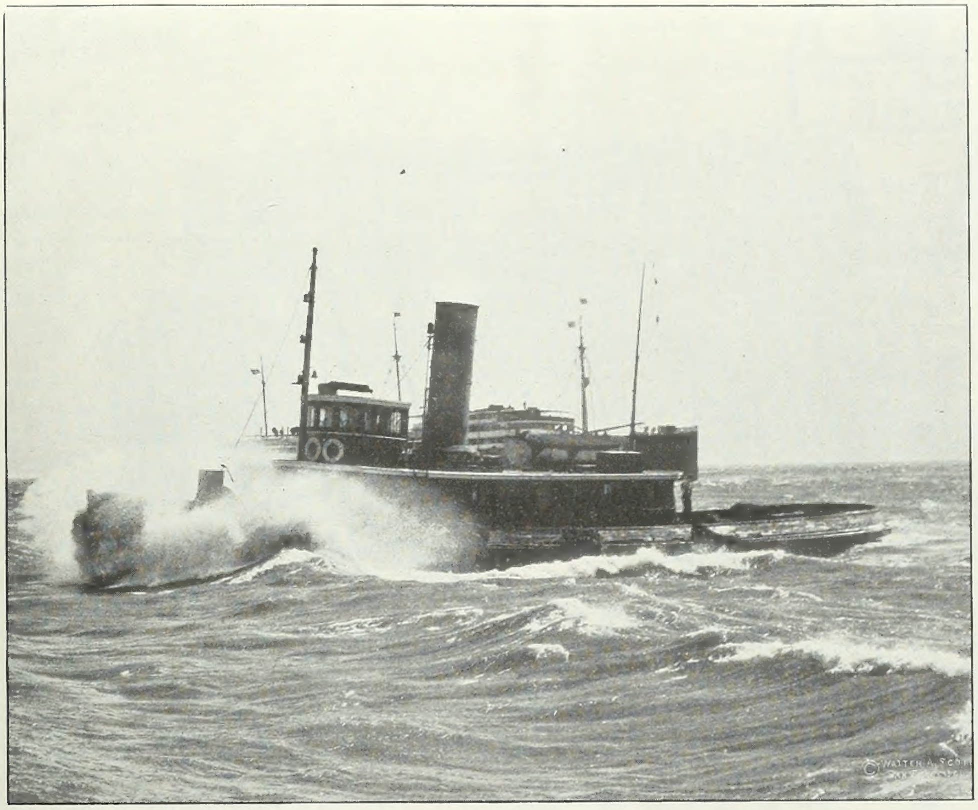
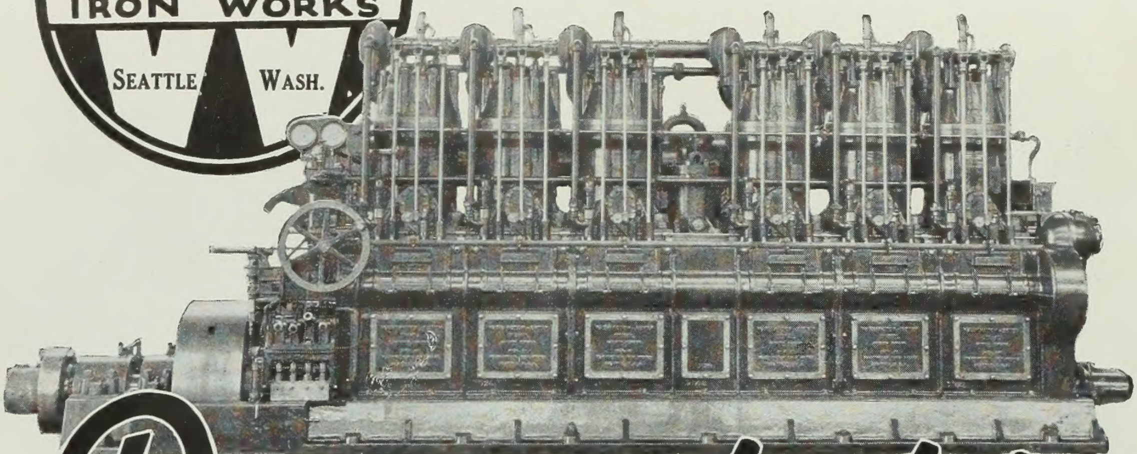


Tug Sea Queen, with steamer Maui in background.
Photo by Walter Scott, San Francisco.

TOWBOATING ON SAN FRANCISCO BAY

San Francisco Bay has many long stretches of deep salt water where certain wind conditions kick up quite a sea. Our photograph has caught one of the large ocean-going tugs bucking a southeasterly gale off the San Francisco waterfront. Note the sea gull balanced on the forward bitts.



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JANUARY 1927 Vol. XXIV. No. 1

Pacific Marine Review

The National Magazine of Shipping

Official Organ
Pacific American Steamship
Association

576 Sacramento Street, San Francisco

Member of Pacific Traffic Association

Official Organ
Shipowners' Association
of the Pacific

James S. Hines,
President and Publisher

Bernard N. De Rochie,
Vice-Pres. and Manager.

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Alexander J. Dickie
Editor.

Paul Faulkner,
Advertising Manager

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Pacific Marine Review is glad to announce that the preliminary six months' experimental work in maritime safety along San Francisco's waterfront has resulted in a decision by the Shipowners Association of the Pacific Coast, the Pacific American Steamship Association, and the Waterfront Employers Union of San Francisco to continue a permanent program for safety education and practice.

Marine Safety First

THE shipowners of the Pacific Coast are establishing a Safety Program for maritime workmen and are putting a lot of time and money into experimental work in order to get a right foundation upon which to build their safety structure. The work is being wisely done under the supervision of a competent consultant in safety engineering, and through the evident beneficial results and the increase in efficiency afloat and ashore, it is commending itself in such fashion that a broad comprehensive program for safety in marine vocations on the Pacific Coast will undoubtedly result.

Lest the men who are providing the cash for this experimental work and its subsequent program should grow discouraged, we direct their attention to the fact that those corporations and associations which are putting over the largest programs and appropriating the largest sums for safety work are getting the largest financial returns from the resultant efficiency and economy effected in their plants. This is true not only in large industrial plants ashore, of which the United States Steel Corporation is, in America, the most conspicuous example, but it is also true wherever adequate safety programs are established at great marine terminals and on great American fleets.

A case in point is the Standard Oil Company (New Jersey). This company carries on a great safety education program on its large fleet of tankers; uses every effort and spares no expense in making every port of its floating property a "safe working location." The leading October editorial in Ship's Bulletin, published by the Standard Oil Company (New Jersey) emphasizes this program as follows:

"In spite of the comprehensive measures toward accident prevention which are constantly being taken, a careful analysis of the lost time personal injuries during the past year, which was recently made by the management, revealed the surprising fact that at least one-third of these accidents could probably have been avoided by the proper exercise of caution on the part of those concerned.

"A close check on dangerous practices aboard ship has been maintained by the port captain and port engineer, and the cooperation of all deck and engine officers has been encouraged at all times. In the past, where careless methods of performing routine tasks aboard ship have been found to be prevalent, they have been brought to the attention of the seagoing personnel by means of appropriate safety posters and, in addition, a summary of lost time accidents occurring during the year is published annually in the Ship's Bulletin. In short, 'Safety First' in the Standard Oil Company (N.J.) fleet has been intended to mean something more than a mere slogan.

"It has been shown that small items of waste in the deck department, engine room, or galley mount up and result in increased store costs; small leaks and minor steam or fuel losses are reflected ultimately in higher fuel consumption. The same is true in the case of personal injuries, and minor bruises or strains, if not properly and promptly cared for, may frequently lead to very serious results. Many of the injuries which do occur result from carelessness in rigging staging, failing to lash ladders or gangways, leaving tools lying carelessly around at elevated points where a roll of the ship may cause them to fall on a man, strains from improper methods of lifting, steam burns caused by clumsy methods and unnecessarily leaving deck gear or other objects in places where someone is sure to fall over them.

"In order, therefore, to eliminate as far as possible these more or less minor injuries and reduce to a minimum the list of preventable accidents, several new safety posters are being prepared, picturizing the practices which have caused most of the recent injuries throughout the fleet, and will be included in future issues of the Ship's Bulletin. A large proportion of all accidents, both on ship and ashore, are the result of careless habits or undue haste and the management earnestly desires that all department heads cooperate in seeing that the safety illustrations are posted in conspicuous places in their respective departments, and, by their example and watchfulness, put the slogan 'Make it Safe' into every job aboard ship.

The Double-Acting Diesel

CONSIDERABLE propaganda has arisen in connection with the performances of the Swedish-American Line motorship Gripsholm, the first large double-acting 4-cycle marine diesel engine installation. This propaganda has taken the form of rumors about tremendous vibration, about the failure of engines to function satisfactorily and about the disappointment of the owners and operators in regard to fuel consumption.

We are very glad to quote a letter from Axel Carlander, chairman of the Swedish-American Line, refuting all of these rumors.

"I am glad," writes Mr. Carlander, "to be in position to state that these rumors are without any foundation whatever. The engines have now been running nearly a year without any trouble and we are very well satisfied with the ship and machinery. How unfounded these rumors are can, I think, best be proved by the fact that we are these days contracting for a sister ship of the Gripsholm and that the machinery of the new ship will be of the same type. We have in fact already placed the order for the machinery with the same firm (Burmeister & Wain) who built the machinery of the Gripsholm."

This letter should be proof positive that the Gripsholm is performing satisfactorily. However, the Gripsholm is by no means the only installation of double-acting diesel engines of 4-cycle type. Harland & Wolff, the British licensees for Burmeister & Wain engines, have turned out a number of jobs of power equal to that of the Gripsholm which are performing very satisfactorily. Among these is the Asturias of the Royal Mail Steam Packet Company, which is now in regular service between Great Britain and the East Coast of South America. Italian shipyards also have several installations of double-acting diesels to their credit.

There would seem to be no very great obstacle to the solution of any operating problems that may come up under the double-acting principle for internal combustion engines. The United States Shipping Board now has in operation the motorship Tampa with a Worthington 2900 horsepower double-acting engine of 4 cylinders, 2-cycle type. This is soon to be followed by others of both 2-cycle and 4-cycle types. The Shipping Board, considering its conversion program an experiment, and operating on plans laid down over two years ago, was willing to expend a large portion of its available funds for the then new and untried double-acting engines. Since that time a number of very high powered double-acting units have been installed and are operating in merchant carriers of the world, and the Shipping Board or any other American shipowner should be able to advance to double-acting diesel installations with no serious misgivings.

Marine Engine Ad Copy

IN a recent issue of a national trade journal devoted to boating, there appeared an article on the technique of writing advertising copy. From this article we extract the following very interesting sentence: "If you are selling a cheap little engine which is only good for rough working boats, you must write your ad to appeal to the workboat owner, who is not, as a rule, a man of high cultural attainments."

The phrase, "cheap little engine which is only good for rough working boats," certainly must have a peculiar appearance to the workboat operator of the Pacific Coast, where for many years the continuous duty internal combustion engine, as developed for workboats, has set the very highest standards for materials, workmanship, and reliability. It may be true that the workboat owner, the fisherman, the rough tugboat operator, is not a man "of high cultural attainments" when judged by collegiate or social standards, but it also is undeniably true that his credit rating and ability to purchase first-class products in the engine line are frequently far greater than those of the highly cultured bi-ped who "high hat's" him along the embarcadero.

It has been our experience in writing advertising copy in regard to marine auxiliaries, propelling machinery, and ship fittings that the men who are interested in the purchase of these things and to whom the advertisement must appeal, as a general rule, want to know just what the record of the article in question has been in installation aboard ship. What will your engine actually do bucking a Northwester from Point Reyes to Flattery? How many tons of cargo per hour will your winch actually handle under the supervision of the worst possible gang of stevedores on the Coast? How much actual fuel saving was accomplished in such and such an installation by the introduction of your economizer? These are the things that interest the shipowner when he is considering the reconditioning of old vessels and equipment of new. They interest, likewise, the boat owners and even the "highly cultured" yacht owner. Real quality is what counts in the marine game.

Shipping Board Sales

THE Tenth Annual Report of the Shipping Board shows the rather remarkable fact that during the fiscal year ended June 30, 1926, 350 ships were sold to private interests. These ships represented a deadweight tonnage of 1,671,390.

Among the more important items sold during the fiscal year were four complete cargo and two complete passenger lines, these six services being disposed of in their entirety. One of the cargo lines, the American Palmetto Line, was subsequently taken back by the Board in order that service might not lapse, some question having arisen as to whether operations would be continued under private ownership.

The sale of the two passenger lines, the Pan American Line and the American Oriental Mail Line, completes the disposal of all passenger services established and operated by the Board, with the exception of the United States Lines, operating from New York to the United Kingdom and Europe, and the combination cargo and passenger service of the American Merchant Line from New York to London.

Due in large measure to the southern industrial development, about 40 steamers of the type built on the Great Lakes during the war, were sold for use in coastwise trade. Nor was the unusual demand for coastal and intercoastal vessels confined to the comparatively small lake-built type. Fifteen ships of the 5000-ton class, and twenty ranging from 7500 to 12,000 tons each, were also sold for service in domestic waters.

Among the 350 ships disposed of were 199 (totaling 813,820 deadweight tons), all practically without market value as commerce carriers, sold to the Ford Motor Company for scrapping purposes.

This large sale of ships during 1925-26 was responsible in considerable measure for the large reduction in operating losses sustained by the Emergency Fleet Corporation. This reduction amounted to more than 50 per cent from fiscal year 1924 to the fiscal year 1926. Operating losses during 1924 amounted to about $41,000,000; in 1925 to about $30,000,000; and during 1926 to less than $20,000,000. The total fleet now under government ownership and Shipping Board control has been reduced to 881 vessels, with a deadweight tonnage of 6,876,069. If the present state of liquidation continues to increase as it has been doing during the past two years, the American merchant marine fleet will all be in private hands or scrapped before 1930.

PACIFIC SHIPPING LEADERSHIP

BACK in the days of forty-nine, all sea tracks led to the Golden Gate. Behind those black mist-wreathed portals lay the lure of the yellow metal and the call of wild adventure. Today in a bigger and better way, the sea paths of the world are converging to the Pacific Coast and to this mighty Pacific Ocean with its new and old wealths of opportunity for the peaceful conquests of commerce. In three-quarters of a century, two generations of men have witnessed marvelous changes on the Pacific Ocean and these changes have been brought about with an accelerating rapidity which fairly dazzles even the most vivid imagination.

Robert Dollar on his 81st birthday.

Suh a field for marine operations, surrounded by such opportunities for cargo and passenger business, naturally draws to itself the great active shipping leaders of the world and develops for itself others equally great.

For many years in the primary stage of its development, the Pacific Coast was more easily and more economically reached by the sea route than by any other. This long range intercoastal marine trade and the older and equally long range sea trade with the Pacific Orient were the two principal factors contributing to America's leadership in ocean-borne commerce prior to the Civil War.

Some of the shrewdest and nerviest of Yankee shipping brains and some of the canniest operators from Great Britain and from other European nations got themselves established in Pacific Coast ports even in the pioneer stage and sent their best younger executives to build wisely and well for the business that they knew would surely develop.

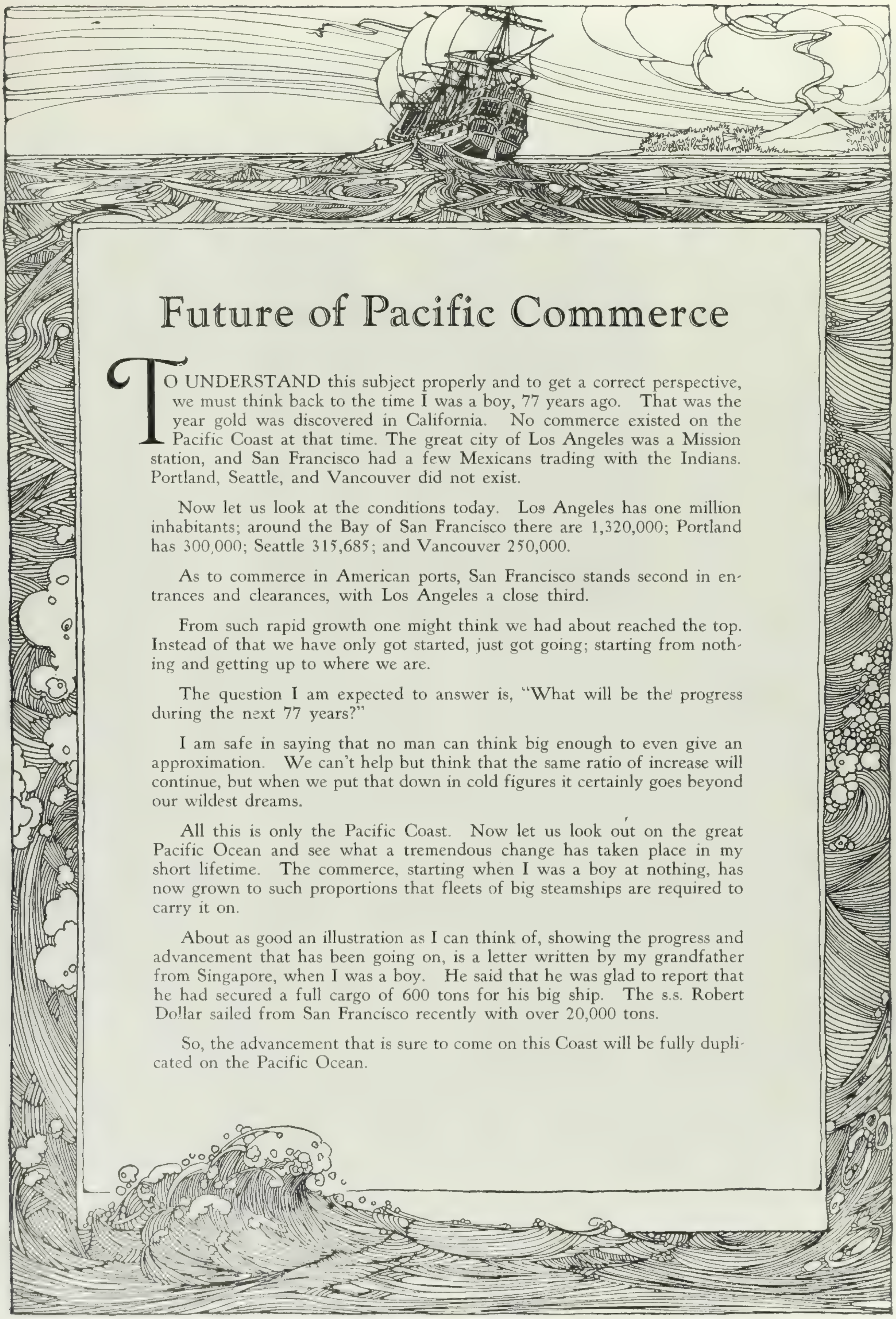
The complete history of the modern maritime development on the Pacific is so recent and yet so large that it is difficult to get perspective. For our purpose, however, it is possible to present the matter very concisely by simply holding up for inspection a few vivid pictures from the life of the man who for many years has held, and today still holds, the complimentary title "Dean of Shipping." The life of Robert Dollar more than spans the entire development, and his experience more than that of any other one man typifies the spectacular growth of Pacific Ocean commerce.

Starting at the age of 10 as a cook's helper in a lumber camp in the Canadian woods, Robert Dollar now controls vast lumber production interests. Entering Pacific coastwise and lumber shipping in 1891 with a small steamer, the Newsboy of 260 net tons, Robert Dollar at the age of 46 began a maritime career that has brought international fame and acknowledged American leadership. Looking at his achievement in shipping from a purely materialistic point of view, as revealed by the tonnage operated, we see that from a single vessel of 260 tons in 1891, his fleet had grown by 1922 to 23 vessels with a total deadweight carrying capacity of 133,038. Today, five years later, the Robert Dollar interests control nearly four times that tonnage capacity and, in addition, a carrying capacity for many thousands of passengers. In 1922 Robert Dollar at the age of 78 conceived and successfully established the magnificent project of a freight liner service on a regular monthly schedule round-the-world. Later this service was expanded to fortnightly sailings and extended to include passenger service.

While busy with this tremendous program of material development, Robert Dollar has always found time for home life and for the responsibilities and duties of citizenship and of cooperative business endeavor. A recital of his private and public charities would fill this volume. For many years he was president of the Shipowners Association of the Pacific Coast and for some years past he has held the chair in the Pacific American Steamship Association. Vice-president of the National Foreign Trade Council, decorated by half the governments of the world, master of America's greatest privately owned fleet, honored and respected in every world port, Robert Dollar typifies leadership in Pacific Ocean shipping.

Pacific Marine Review, official organ for the Shipowners Association of the Pacific Coast and the Pacific Amerncon Steamship Association, asked Robert Dollar to prepare for Pacific Coast shipping men a forecast of future conditions in Pacific Ocean commerce. Turn to the two following pages and read the prophecy and take courage "to do and dare and get your share" of the good things coming in 1927 and the years beyond.

A gude New Year, ye Shipping men,
 As ye put out to sea,
May a' your ships frae ilka berth
 Richt fu' wi' cargoes be.



Future of Pacific Commerce

TO UNDERSTAND this subject properly and to get a correct perspective, we must think back to the time I was a boy, 77 years ago. That was the year gold was discovered in California. No commerce existed on the Pacific Coast at that time. The great city of Los Angeles was a Mission station, and San Francisco had a few Mexicans trading with the Indians. Portland, Seattle, and Vancouver did not exist.

Now let us look at the conditions today. Los Angeles has one million inhabitants; around the Bay of San Francisco there are 1,320,000; Portland has 300,000; Seattle 315,685; and Vancouver 250,000.

As to commerce in American ports, San Francisco stands second in entrances and clearances, with Los Angeles a close third.

From such rapid growth one might think we had about reached the top. Instead of that we have only got started, just got going; starting from nothing and getting up to where we are.

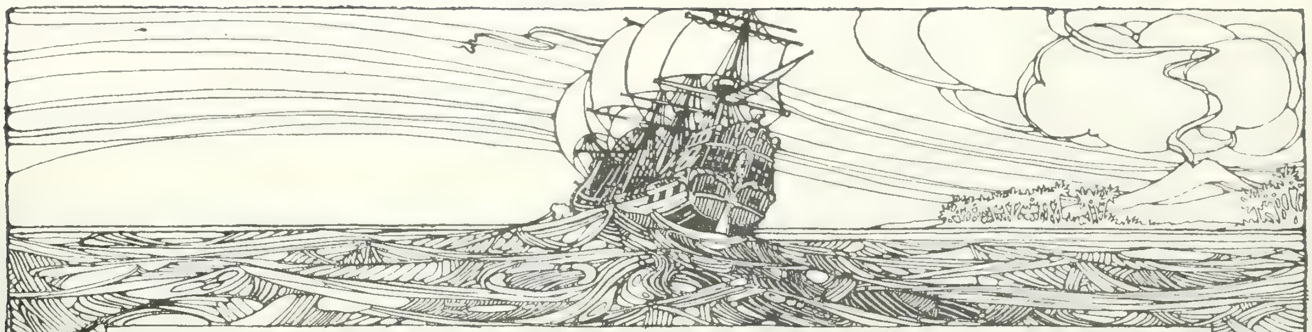
The question I am expected to answer is, "What will be the progress during the next 77 years?"

I am safe in saying that no man can think big enough to even give an approximation. We can't help but think that the same ratio of increase will continue, but when we put that down in cold figures it certainly goes beyond our wildest dreams.

All this is only the Pacific Coast. Now let us look out on the great Pacific Ocean and see what a tremendous change has taken place in my short lifetime. The commerce, starting when I was a boy at nothing, has now grown to such proportions that fleets of big steamships are required to carry it on.

About as good an illustration as I can think of, showing the progress and advancement that has been going on, is a letter written by my grandfather from Singapore, when I was a boy. He said that he was glad to report that he had secured a full cargo of 600 tons for his big ship. The s.s. Robert Dollar sailed from San Francisco recently with over 20,000 tons.

So, the advancement that is sure to come on this Coast will be fully duplicated on the Pacific Ocean.



As one nation must have others to trade with, it is in order, therefore, to look across the water.

What do we see? Sixty-five years ago Commodore Perry compelled the Mikado, much against his will, to open two small ports in Japan to foreign commerce.

What has been the result?

Japan is now one of the great commercial nations of the world. The city of Osaka is one of the great manufacturing centers of the world, a veritable city of smoke stacks. We are carrying the manufactured products of Japan as far as Egypt.

Then there is China. On a small scale they have been a trading nation for thousands of years. But it is only during the last forty years that any real progress has been made, and it was only by the greatest efforts that the English-speaking countries were able to get a start made.

What has happened in that short space of time?

Shanghai, in entrances and clearances, has risen to be the second seaport of the world, with Hong Kong a close third, London coming fourth.

I don't hesitate to say that the greatest development in the world's trade is going to take place in China, to a great extent on the Yangtsze River and its tributaries, on whose shores over one-eighth of the inhabitants of the world live. In this great country of 500 million people the surface has only been scratched by foreign trade, and even with the terrible disadvantage of continuous civil war going on, commerce is increasing by leaps and bounds.

So the reason we are sure of gigantic development on the Pacific Coast is that we have Japan and China just across the ocean to trade with, to say nothing of the rapid increase of our trade with the Philippines, the Straits Settlements, and Java.

And because of all this I continue to say that the time is rapidly approaching when the center of the world's commerce will be transferred from the Atlantic to the Pacific; the same as it was transferred from the Mediterranean to the Atlantic.

Robert Dollar

The Pacific Coast Lumber Schooner

A Sketchy Account of the Development of the Coastwise Lumber Carriers Serving Pacific Ports

By Ralph W. Myers

THE Pacific Coast schooner is a great institution. Practically every great shipowning and operating firm in San Francisco started with a schooner.

Robert Dollar, a name to conjure with in maritime circles the world around, began his adventures on the sea through the ownership of a lumber schooner. One great fleet of the Robert Dollar Steamship Company now regularly circles the globe and another weaves back and forth across the Pacific, carrying freight and passengers between the "newest cities of the Occident and the oldest civilizations of the East."

Captain William Matson, another Pacific viking, started with a schooner. Today the fine passenger and freight vessels of the Matson Navigation Company connect San Francisco in regular services to the Island Empire of the Pacific, and the Malolo, fastest and finest liner ever built in an American shipyard, is rapidly nearing completion to join this service early in the spring of this year.

A picture of the model of the schooner Star of Oregon, first schooner built by Americans on the Pacific Coast; launched on the Willamette River in 1841.

We could go on with many other instances of the by-products of schooner operation, but these will suffice.

The first vessel built on the Pacific Coast was a schooner. This craft, the Northwest America, had an international flavor. In 1788 Captain John Meares, a British navigator who the year before had visited Nootka Sound on the west coast of Vancouver Island, came back to that point in command of the Portugese ship Felice from Canton. Seeing on his first trip the possibilities in the native timber, Meares brought back with him a number of Chinese carpenters, the necessary tools, and some ironwork for a vessel. The Northwest America, a schooner of 40 tons burden, was launched complete, flying the British ensign, on the 20th of September, 1788. A "Kanaka chieftain from the Sandwich Islands," a group of Northwest Indian Chiefs, and Captain Robert Gray and crew of the American sloop Washington assisted in the celebrations.

The Northwest America sailed for Canton October 27, 1788, returning the following year to find the Spaniards in possession and claiming sovereignty over that region. She was seized, together with other British vessels, and her name under the Spanish flag was changed to Gertrudis. Incidentally the settlement of this Spanish difficulty at Nootka Sound was one of the reasons for the great voyage of Captain George Vancouver in the British naval vessels Discovery and Chatham.

Scene at the launching of the first vessel built on the Pacific Coast, the schooner Northwest America. This vessel was built in 1788 on the west coast of Vancouver Island by a British navigator, Captain John Meares.

So far as we know the next schooner built was the Star of Oregon, constructed on the Willamette River in 1841 by American farmers, who, lacking cash and wanting cattle, had determined to build a vessel, run her to the then Spanish settlement at Yerba Buena (now San Francisco), and trade her for stock. This enterprise was highly successful. The promoters sold their vessel to good advantage, remained a winter in Yerba Buena, and returned in the spring overland with 42 converts to the Oregon boosting spirit, 1250 head of cattle, 600 horses and mules, and nearly 3000 sheep. This adventure is notable in that it broke up for all time the Hudson Bay monopoly in Oregon and also in that it probably started the infant city of San Francisco in its magnificent career of shipowning, shipbuilding, and ship operating.

Since those days, there have appeared on Pacific shores multitudes of schooners of many types adapted to various special seafaring occupations. Thus we have the South Sea Island trading schooners, the halibut schooner, the oyster man's schooner, the pilot schooner, the flat-bottom scow schooner, and possibly most important of all, the lumber schooner.

On the Pacific Coast the pioneers found virgin stands of wonderful pine, cedar, spruce, and redwood timber growing all along the ocean shore from Monterey Bay north. Harbors were few and far between, particularly on the rugged northern California coast, and there were no railroads and very few wagon roads or even trails. Vessels of comparatively light draft, able to stand in almost at the surf line and take sling loads of lumber from an overhead line or from the sea end of a long chute, whose inshore end was fed from a high bluff, were the necessary development from such conditions. The schooner, 125 to 175 feet in length and 28 to 35 feet beam, with a deep waist arranged to take a tall deck load, and with forecastle quarters for crew and poop quarters for officers seemed to fill the bill.

Lumber was hauled from the outports and all ports as far north as Puget Sound to San Francisco, San Pedro, and San Diego. As the markets developed and the necessity of more regular service became apparent, these schooners were gradually equipped with steam plants. These again, through gradual process of evolution, have been replaced by larger, better, and faster vessels, until the great Pacific Coastwise lumber fleet of today is the result.

An old timer thus describes the conditions forty years ago on the first steam schooners and compares them with conditions as he sees them today:

They (the schooners) were then not much over 150 feet in length with 30-foot beam. The accommodations for officers and crew were crude; in some of them the crew was berthed forward under the forecastle head. The captain generally had a room to himself; but in many of the old schooners the two mates occupied a room over the boilers on the main deck. The firemen had the other side. Two engineers had a small room, sometimes aft, and occasionally on the upper deck. There was no running water. The sanitary arrangements were simple. Bath rooms or hot and cold running water were unknown. Cook and steward were as a rule one person, with a waiter who helped out in galley work.

The engines were usually 14-inch and 28-inch by 24-inch stroke, though some were even smaller. One boiler with two fires supplied the steam. There were no electric lights; the fuel was coal. Two firemen stood six hours on and six off, as did the engineers. In "open ports" such as Rockport and Westport, the firemen stood their regular watches in port and acted as watchmen as well, the balance of the crew turning in after a long day handling lumber. There was no such thing in those days as overtime.

The vessels plugged up the coast, in the summer time generally bucking a north-wester, and helped out by the fore and aft sails. The steering was by hand with no steam help. Generally one steam winch set on the forecastle head, and was also the anchor hoist and docking engine. Aft it was hand pulling.

Arriving at one of the outside ports, the craft was moored and put "under the wire," which led from the high cliffs out over the schooner's decks to a mooring anchor.

A donkey engine on the shore at the head of the wire was the motive power that handled the sling loads of lumber and freight. A messenger from the schooner's winch took the weight off the wire, and by

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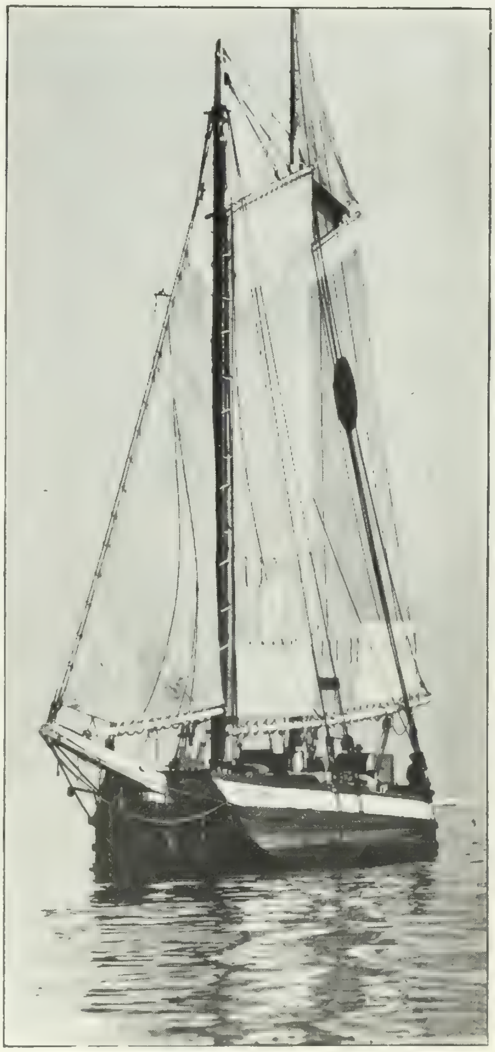
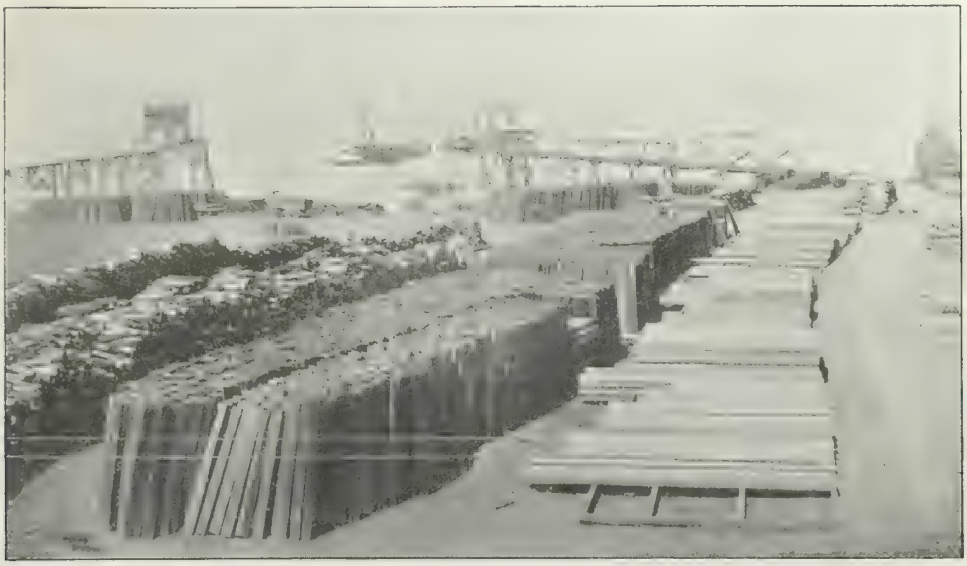
The Mud Scow Schooner

We present herewith two very interesting pictures of the Pacific Coast mud scow type vessel, a flat bottomed schooner of very good sailing capacity developed for navigation into sloughs and over tidal flats.

In the old days under sail these vessels carried a large portion of the river and slough traffic tributary to San Francisco Bay. With gasoline and diesel power plants the same type frequently may be seen today navigating the Petaluma channel, the Napa river, and other tributaries of San Francisco's vast harbor, carrying out great loads of baled hay, sacked barley, or bulk sand and gravel.

The photographs are by Walter Scott, San Francisco.





AT AN OUTPORT

One of the picturesque phases of handling lumber by water on the Pacific Coast is the loading at outports. For hundreds of miles along Oregon and northern California coasts there are no harbors. The beaches are very narrow and are backed by high bluffs, often of a very rocky character. In such locations timber is loaded on board vessels, either by chutes or from an overhead wire. Our illustration shows a steam schooner under the wire at an outport in Mendocino County on the California Coast.

hoisting it well up, the sling loads from shore were kept above the rail until over the deck, when they were lowered, unhooked, and stored. The empty slings were sent back and this operation was continued from daybreak to dark until the vessel was laden. The deck lashings were then made fast, and it might be ten at night before the lumber drogher got under way, with her main deck about a foot or two under water and the deck load piled nearly to the top of the upper deck house.

After getting under way, if the weather was fine, little attention was paid to navigation; and no wonder. The whole crew had perhaps worked on an average fourteen hours a day from the time the wire had been on board. And the work was hard, too. At that time the qualifications for a second mate were that he should be able to carry two ties, one under each arm, while loading. The mate generally looked after the slings, and the skipper was all over the job, everyone doing something. One of the firemen ran the winch, and the engineer kept steam, doing such other work as he could by himself. At times both engineers would be up during the day, as they slept all night at these ports.

San Pedro and other southern ports were then as now the principal points to which the lumber was taken, though a great deal also went to San Francisco.

In any case, as the vessel entered harbor the mate would shout down the engine room hatch, "Fireman to run the winch," and the man on watch would then leave the hot engine room to take a cold job hoisting out the cargo, the engineer, meanwhile, keeping steam, though if it was an "inside port" both firemen would be up, as no night watchman was needed, the fires being banked at night.

The culinary arrangements were crude, but the food was plentiful and good. However, the captain, engineers, and mates were the only ones who had a table to eat from. The firemen had a sort of shelf in one side of the engine room, and the deck crew ate on deck when weather permitted, otherwise the food was taken to the forecastle. But all were happy and worked with a will, there being a keen rivalry among the men and officers of different vessels as to who could get the most loads delivered in a given time. The loads were not large, either, probably none of them scaling much more than a hundred and fifty thousand feet.

But what a difference later, with big steel vessels, built to carry two million feet or more, and triple-expansion engines, four and six hoists with regular "winch-spinners"; the firemen with three watches; oil fuel; three watches for the engineers, with oilers as well; latest types of cabins, with all the comforts of a liner; electric lights and fans; steam heat and wireless. What a difference!

To go on one of the Pacific Coast lumber droghers now is like going on a pleasure cruise compared with the conditions thirty years or more ago.

Vsssel—	M. Ft.
A. M. Campbell, Sc..	750
Alice, Sc.	300
Alice Cooke, Sc.....	925
Alicia Haviside, Bkt..	1850
Alliance, Str........	350
Alumna Sc	1000
Alvarado, Str.	1350
Alvena, Sc.	950
Aneiura, Fr. M/S....	1130
Anne Comyn, Bkt....	1850
Anne Hanify, Str....	1350
Annette Rolph, Str...	1300
Annie M. Reid, Sh...	1800
Annie M. Rolph, Bkt.	1500
Astoria, Str........	2050
Aurora, Bkt........	1250
Avalon, Str.........	930
Azalea, Sc.........	420
B. M. Hanlon, Str...	400
B. P. Cheney, Bk...	1000
Bandon, Str.........	625
Bangor, Sc..........	550
Barbara C. Str......	1325
Bert E Haney, Str..	1650
Bertrand, Bge	2500
Beulah Sc..........	440
Bohemia, Sh........	1350
Boobyalla, M/S.....	1600
Brookdale Str	1750
Brookings, Str......	1900
Brooklyn, Str.......	350
Brunswick, Str......	455
C. Christenson, Str...	850
C. A. Thayer, Sc....	575
C. G. Sudden, Str....	2000
C. R. McCormick, Str.	4500
C. S. Holmes, Sc....	600
Cadaretta, Str..........	
Caddopeak, Str......	2000
Camano, Sc.........	900
Carlos, Str.........	850
Carmel, Str........	681
Cascade, Str........	1700
Caspar, Str........	750
Castle Town, Str....	2900
Centennial, Bkt.....	900
Centralia, Str.......	550
Challamba, M/S.....	1500
Charles R. Wilson, Sc.	440
Chehalis, Str........	675
City of Sydney, Bkt..	2100
Claremont, Str......	1250
Cleone, Str.........	200
Columbia, Sc	900
Commerce, Sc.......	900
Commodore, Sc......	1600
Conqueror, Bkt......	1600
Coos Bay, Str......	2900
Coveria. Str.........	1950
Crescent City, Str....	650
Cricket, Str.........	1200
Culburra, M/S......	1500
D. Wintermote, Str..	1750
Dacula, Bge........	2500
Daisy, Str..........	725
Daisy Freeman, Str...	675
Daisy Gadsby, Str...	950
Daisy Gray, Str.....	1250
Daisy Matthews, Str..	1100
Daisy Putnam, Str...	1056
Dan F. Hanlon, Str..	1400
Dauntless, Sc.......	4056
Davenport, Str......	975
David Dollar, Sh....	1800
Donna Lane, M/S...	1600
Doylestown, Str......	2000
Dunsyre, Sh.........	1900
E. Johnson, Str.....	1275
E. F. Whitney, Bk...	1000
E. H. Meyer, Str....	1025
E. R. Sterling, Bkt..	2500
Echo, Bkt..........	950
Ecola, Bkt..........	1900
Edna, Str..........	1250
Edna Christenson, Str.	2150
El Abeto, Str......	1850
El Capitan, Str.....	2050
El Capitan, Str.....	1350
El Cedro, Str......	2150
El Cicuta, Str......	1850
Elinor H., Sc.......	1600
Eliz. J. Rolph, Bge...	1650
Elizabeth, Str.......	375
Ella A., Sc.........	1550
Esther, Sc..........	280
Esther Buhne, Sc....	375
Everett, Str........	1800
F. Olson, Str.......	1000
F. A. Warner, Str...	1375
F. S. Loop, Str.....	850
Forest Dream, Bkt...	1550
Forest Frienl, Bkt...	1550
Forest King, Str.....	1600
Forest Pride, Bkt....	1550
Forester, Sc........	750
Fort Bragg, Str.....	815
Fox, Sc...........	450
Frank D. Stout, Str..	1000
Frank Lynch, M/S...	1750
Fred Baxter, Str.....	1100
Fred J. Wood, Sc....	800
Galilee, Sc.........	400
General Fairchild, Bge.	1100
George E. Billings, Sc.	1500
Geirge L. Olson, Str..	1360
George U. Hind, Bkt.	1500
Georgiana Rolph, Str..	1300
Georgina, Bkt.......	1175
Glendale, Sc........	420
Glymont, Str........	2000
Golden Gate, Sh....	2000
Golden Shore, Sc....	950
Golden State, M/S...	250
Grays Harbor, Str....	685
Griffco, Str.........	1370
Griffdu, Str.........	1370
Griffson, Bge.......	2100
Guy C. Goss, Bk....	1150
H. B. Lovejoy, Str...	1000
H. F. McCormick, Str.	2900
H. W. Baxter, Str...	2000
H. X. Baxter, Str....	1175
Halco, Str..........	1135
Hanley, Str........	5000
Harold Dollar, Str...	3500
Hawaii, Bkt........	1150
Hartwood, Str......	1025
Hecla, Bk..........	1150
Helen P. Drew, Str..	280
Helene, Str........	700
Henry Villard, Bge...	1260
Henry Wilson, Sc....	475
Hesperian, Bkt......	1500
Hoquiam, Str.......	680
Idaho, Str..........	1100
Indiana, Sh.........	1300
Irene, Sc..........	950
Isonomia, Pan. Str...	3000
J. B. Stetson, Str...	750
J. D. Peters, Bge....	800
J. L. Stanford, Bkt..	1200
Jacox, Str.........	2000
James Dollar, Sh....	2700
James Johnson, Bkt..	1300
James Rolph, III, Str.	1600
James Rolph, Sh....	1500
James Tuft, Bkt.....	1400
Jane Nettleton, Str..	1500
Janet Dollar, Sh.....	2700
Johan Poulsen, Str...	800
Johanna Smith, Str...	1440
John W. Wells, Sc...	3000
Joseph Dollar, Sh...	2200
Juvigny, Str........	1850
K. Donovan, Str.....	950
K. G. Pedersen, Bkt..	1800
K. V. Kruse, Sc.....	1700
Katherine, M/S.....	1800
Katherina, Str......	500
Katherine Mackall, Bkt	1850

Table reproduced from the Marine Register of the Fireman's Fund Insurance Company showing the names and capacities of the Pacific Coast lumber fleet.

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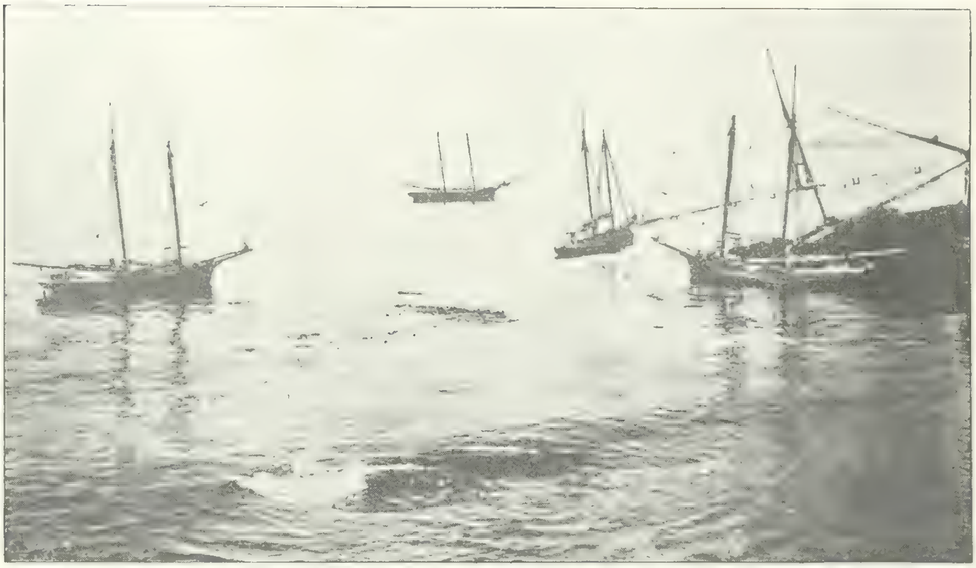

UNDER THE CHUTE

Our illustration herewith is taken from a rare old photograph showing sailing schooners under the chute at Rockport, Mendocino County, California. Note the schooner at the right, practically laying against the cliff. The schooners are moored to offshore buoys and the lumber is slid down the chute to be stowed away in the hold and on deck by the crew.

Of course lumber and all products were cheaper then than now. It did not cost so much for labor, and the men then worked well and willingly. The conditions may have been hard, but no one minded them. The uplifters had not then started to let the workers know how ill-treated they were, and the workers, fortunate fellows, did not know it, but plugged along, saving their wages in many cases and buying into a vessel, so that they had an interest in keeping things going."

The development of the lumber schooner and the development of harbors, piers, and lumber handling equipment have proceeded along parallel lines and have kept fairly even pace with the demands of the industry. What these demands mean today is shown by tremendous totals of water-borne lumber shipments in the last few years. The aggregate figure for the Pacific Coast is now a little under six billion feet of lumber moved by water each year.

A large part of this total moves American intercoastal and foreign in large ocean-going freighters, but the coastwise carrying of lumber and much of the assembling of lumber cargoes are still done by the steam schooner fleet, and the operations of that fleet are still attended by the hazards of coastwise navition on a coast very inhospitable to ships. "Our best navigation school" is still true of the small coastwise steam schooners as it was of her predecessor in the days of canvas.

The improvement of coast harbors and the arrangements for loading at outports is allowing increases in permissible draft, and the use of larger vessels. This increase in size not only permits but demands more powerful auxiliaries for handling cargo and more economical means of propulsion.

The same brains and initiative that provided coal burning Scotch boiler, compound engine plants to supplement sail, substituted oil-burning water-tube boilers and triple expansion jobs at higher pressure, will go to diesel, diesel-electric, or high pressure steam as the demands of the trade warrant the change. Ship cranes, standardized sling load units, automatic mechanical handling of entire cargo, any and every improvement that will speed up the dispatch, lower the specific capital charge, and increase the net earning finds a place in the vision of the lumber schooner operator as much as it does on the drawing board of the naval architect or marine engineer. We predict changes in the next forty years as great as any that have marked the last forty; but no matter how great such changes may be, the lumber schooner holds her undying fame on the Pacific as the maritime cradle, the sea mother, of the great lumber industry and its great fleet of ocean carriers.

Vsssel—	M. Ft.
Kohala, Bkt	1000
L. G. Burgess, Bk	1300
L. J. Morse, Bk	1100
Lahaina, Bkt	1300
Lackawana, Str	1500
Lake Frances, Str	1750
Lassen, M/S	1160
Lord Templeton, Bk	1950
Lottie Bennett, Sc	750
Louise, Sc	375
M. Buehner, Str	1239
M. E. Foster, Sc	1100
M. E. Moore, Shr	3039
Mahukona, Str	4041
Makaweli, Str	4041
Makaweli, Bkt	1040
Makena, Str	4382
Mary Dollar, Sh	2200
Maweema, Sc	600
Mayfair, Str	1090
Mazatlan, M/S	1576
McLaurin, Bk	890
Melrose, Sc	800
Meteor, Sc	840
Metha Nelson, Sc	600
Mindanao, Sc	750
Minnie A. Caine, Sc	1100
Monitor, Bkt	1950
Monongahela, Sh	2250
Monterey, Bkt	1500
Monterey, Pan. M/S	1500
Moshulu, Sh	3000
Mukilteo, Str	1050
Multnomah, Str	975
Muriel, M/S	1700
Muriel, Sc	700
Necanicum, Str	775
Nehalem, Str	750
Nome City, Str	800
North Bend, Sc	1000
Northland, Str	650
Nottingham, Bge	1500
Noyo, Str	1250
Nushagak, Str	550
Oceania Vance, Sc	550
Olympic, Str	1750
Oregon, M/S	1500
Oregon, Str	1100
Oregon Fir, Sc	2200
Oregon Prince, Sc	2100
Oriental, Bk	1400
Pactolus, Bk	1400
Pasadena, Str	340
Philippine, Sc	750
Phoenix, Str	316
Phyllis, Str	1275
Phyllis Comyn, Bkt	2000
Point Arena, Str	1800
Point Judith, Str	1950
Point Lobos, Str	1950
Point Loma, Str	1800
Port Angeles, Str	1150
Prentiss, Str	400
Prosper, Sc	275
Puako, Bkt	1400
Quinault, Str	1200
R. Haviside, Bkt	1850
R. Johnson, Str	1750
R. Mahoney, Str	900
R. E. Wood, Bge	1160
Raita, Fr. Sc	340
Raymond, Str	700
Repeat, Sc	520
Reuce, Sh	1375
Robert R. Hind, Sc	700
Rolph, Bkt	1500
Romagne, Str	2850
Rose Mahoney, Sc	2300
Rosamond, Sc	1200
Roy Somers, Sc	400
Ruby, Pow/Sc	313
Ryder Hanify, Str	1350
S. Christenson, Sc	825
Saginaw, Str	800
Salvator, Sc	550
Samar, Sc	950
Samoa, Str	1650
San Diego, Str	1500
San Pedro, Str	2050
Santa Ana, Str	550
Santa Barbara, Str	600
Santa Inez, Str	1500
Santa Monica, Str	550
Santiam, Str	1130
Sea Foam, Str	200
Sequoia, Gas/Sc	475
Shasta, Str	900
Sierra, M/S	1200
Sierra, Str	1200
Silverado, Str	1400
Simon F. Tolmie, Bkt	1700
Siskiyou, Str	1000
Skagway, Str	1050
Solano, Str	1050
South Coast, Str	300
Spokane, Sc	800
St. Nicholas, Sh	1400
St. Paul, Sh	1350
St. Katherine, Bk	800
Stanwood, Str	1175
Star of Alaska, Sh	1500
Star of Chile, Bk	700
Star of England, Bk	1670
Star of Falkland, Sh	1750
Star of France, Sh	1250
Star of Fn'and, Bk	1400
Star of Greenland, Sh	1900
Star of Holland, Bk	1740
Star of India, Bk	750
Star of Iceland, Bk	1800
Star of Italy, Sh	1250
Star of Peru, Bk	650
Star of Russia, Sh	1500
Svea, Str	700
T. P. Emigh, Bkt	1350
Tahoe, Str	700
Tamalpais, Str	550
Taurus, Sc	750
Thistle, Sc	1600
Tiverton, Str	550
Trinidad, Str	1145
Unimak, Str	230
Vanguard, Str	335
Vigilant, Sc	1700
Viking, Str	1250
W. Donovan, M/S	1800
W. B. Flint, Bk	650
W. F. Burrows, M/S	1072
W. F. Jewett, Sc	640
W. R. Chamberlin, Jr	2200
W. T. Lewis, Sh	1900
Wahkeena, Str	1025
Wallingford, Str	1400
Wapama, Str	1050
Washington, Str	500
Washougal, Bge	1000
Washtucna, Bge	1000
Wawona, Sc	570
Wellesley, Str	675
Westport, Str	225
Whitney Olson, Str	1500
Willamette, Str	900
Willapa, Str	1100
William Bowden, Sc	950
William Dollar, Sh	2200
William H. Smith, Sc	750
William H. Smith, Sc	1350
Wilmington, Str	1000
Yellowstone, Str	775
Yosemite, Str	825
Zampa, Sc	500

Table reproduced from the Marine Register of the Fireman's Fund Insurance Company showing the names and capacities of the Pacific Coast lumber fleet.

Cooperative Employment Service

The Shipowning Associations of San Francisco Making Successful Effort to Stabilize Maritime Employment

EARLY in 1922, following a long drawn out labor dispute and strike on the San Francisco waterfront, the Pacific American Steamship Association, the Shipowners' Association of the Pacific Coast, and the Waterfront Employers' Union of San Francisco united in establishing an Employment Service Bureau to take care of maritime personnel problems in the Port of San Francisco. This Service Bureau has been functioning with increasing usefulness ever since; and its accomplishments are very modestly summed up by its general manager, Captain W. J. Petersen, in the two following paragraphs, which form part of the conclusion of his last annual report:

"After five years of successful endeavor we may come to some conclusions as to the value of the service rendered to those who pay the cost of operation, to the Port of San Francisco, and to the community at large. We have paid high wages, and during periods of commercial depression we have not reduced our wage scale. We have kept faith with our employes, made good in our promises to them, and in so doing secured a measure of confidence, respect, and efficiency not hitherto enjoyed. In return we have increased efficiency and reduced pillage and breakage in longshore operations and have maintained a continuous supply of seamen who man our ships so that departure has not been delayed nor marine service impaired.

"We have maintained the public peace on the San Francisco waterfront for over five years. We have dispensed millions of dollars in wages and incidental costs to thousands of employes, thereby adding to the taxable wealth of all the cities on the Pacific seaboard and particularly the cities bordering on San Francisco Bay. This has all been done by the cooperation of the employer and the employe working in harmony for their own advantage as well as the advantage of the general public."

The tables herewith recapitulate the activities of the bureau and show the assignments made, the bonuses paid, and the discharge books issued. The increase in the two former items and the decreases in the third show that the Service Bureau activities result in more efficient and more contented crews and less turnover. These figures, however, by no means tell all the story.

The basic principle upon which the Service Bureau was established was, and is, "A square deal all around." A square deal to the shipowner, a square deal to the man before the mast, to the licensed deck officer, to the fireman, to the cabin boy, to sparks, to the doctor, and a square deal to the stevedore. The men, themselves, are realizing that there is a determination to be fair on the part of the square-jawed manager and his assistants, and on the part of the shipowners who stand squarely back of this policy.

In working out this "Square Deal" policy a bonus

RECAPITULATION OF MEN SHIPPED THROUGH SAN FRANCISCO OFFICE.

YEAR	LICENSED OFFICERS	WINCHMEN	ABLE SEAMEN	ENGINE DEPARTMENT	STEWARD DEPARTMENT	TOTALS.
1921	63	118	1641	1269	1549	4,640
1922	53	403	9780	3349	3281	16,866
1923	78	539	10683	5098	4538	20,736
1924	26	565	9069	4385	4572	18,617
1925	21	793	11303	5510	5613	23,240
TOTALS.	241	2,418	42,476	19,611	19,353	84,099

RECAPITULATION OF MEN SHIPPED THROUGH SAN PEDRO OFFICE.

1921	13	36	689	295	181	1,214
1922	83	132	3620	926	862	5,623
1923	250	538	8632	3673	3186	16,279
1924	131	320	3502	1905	1842	7,700
1925	101	300	4563	2343	1785	9,082
TOTALS	578	1,326	21,006	9,142	7,856	39,908

RECAPITULATION OF MEN SHIPPED THROUGH SAN FRANCISCO AND SAN PEDRO OFFICES.

1921	76	154	2330	1564	1730	5854
1922	136	535	13400	4275	4143	22489
1923	328	1077	19315	8771	7524	37015
1924	157	885	12571	6290	6414	26317
1925	122	1093	15866	7853	7398	32332
TOTALS	819	3,744	63,482	28,753	27,209	124,007

Table showing number of men shipped by the Employment Service Bureau.

	LICENSED OFFICERS.				UNLICENSED CREW.											
	DECK		ENGINE		WINCHMEN		A. B.		ENGINE		STEWARD		RADIO		TOTALS.	
YEAR	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.
1922	68	$ 911.24	46	$ 605.17	22	$ 323.25	40	$ 533.79	100	$ 815.21	25	$ 454.00	10	$ 168.50	311	$ 3,811.16
1923	647	8,694.24	528	7,502.70	300	4,349.15	343	4,914.02	491	7,116.65	314	5,480.96	97	1,325.95	2720	39,943.72
1924	710	9,715.42	515	6,764.36	276	5,261.78	581	10,002,56	529	8,228.59	370	6,037.76	88	1,410.34	3079	47,425.79
1925	562	7,476.92	492	6,701.87	286	4,244.95	419	7,055.29	562	8,477.37	326	5,237.24	--	---	--	2660	39,193.64
TOTALS	1987	$26,797.82	1581	$21,634.16	884	$14,179.13	1383	$22,505.66	1682	$24,637.82	1035	$17,209.95	195	$3,404.79	8770	$130,374.31

TOTAL INDIVIDUALS RECEIVING BONUS FROM 1922 to 1925 INCLUSIVE:

LICENSED DECK OFFICERS	LICENSED ENGINE OFFICERS	ABLE SEAMEN	WINCH-MEN	ENGINE	STEWARDS	RADIO	TOTALS
260	255	285	348	149	152	30	1479

Table of bonuses paid by the Shipowners Association of the Pacific Coast for continuance in service.

system has been established. The Shipowners Association of the Pacific Coast on all vessels owned by its members pays bonus to all members of the ship's crews after six months continuous employment. The total disbursement made or payable under this system up to January 1, 1927 is approximately $175,000.

Much relief and aid have been afforded to temporarily indigent marine workers, not as charity, but as a temporary loan. The total advanced in this way for bed and lodging in 1925 was $1046.37. Of this sum, 20 per cent had been returned by these men as of January 1, 1926. Some 900 pieces of sailors' baggage were checked and stored in a fire-proof room without charge during 1926. During 1925 there was advanced to seamen who had been wrecked and had lost their personal effects $940 to enable them to rehabilitate and continue in their work.

The relief work of 1925 that is most striking from the human interest point of view was arranging entrance at Sailors' Snug Harbor for seventeen old seamen who were no longer capable of active work at sea. Securing permission for entrance, preparing the necessary papers, and arranging for the reception at the Harbor was a work of appreciation rendered by the Service Bureau. Transportation for these men was gladly given by the Luckenbach Steamship Company, the American-Hawaiian Steamship Company, the Dollar Steamship Company, The Panama Mail Steamship Company, the Isthmian Line, and the Panama Pacific Line. Thus seventeen old shellbacks were made comfortable and happy and "acquired safe anchorage for the remaining period of their lives."

In studying the activities of an employment service bureau, one of the great indices to usefulness is the rate of turnover in employed personnel. Turnover aboard ship is notoriously great. One prime reason for this is the general lack of effort to make conditions of employment attractive or tenure of employment certain. A definite effort is being made by the Employment Service Bureau to impress on executive officers aboard ship the advisability of trying to make sea service more attractive and by so doing keep efficient and satisfied men working the floating property at "100 per cent" effectiveness.

Intelligent use of the discharge book system is a great help to this end. The value of these books to the men is becoming more noticeable. They serve a means of identification; they are helpful when naturalization papers are requested; they aid the men when reporting to the marine hospitals; and they fix their standing as to morality and efficiency on shipboard. No longer do we hear caustic criticisms against these books, and many men display a pardonable pride in their personal records. These books are very useful to the licensed personnel on board ship when an applicant is trying to secure a position, as they show at a glance the conduct and efficiency of the man in question. These books are also used by the men to show their willingness to work when some officious policeman picks them up on suspicion, and they have provided men who are stranded, with a meal and a bed in many cases.

The records show that during the life of the bureau with a fifty per cent increase in assignments there was almost a fifty per cent reduction in discharge books issued.

The employment office is a place of friendly contact with the seamen. This is manifest in the record for harmony enjoyed during the past five years on the San Francisco waterfront. Every effort is being made to increase this harmony. The "Square Deal" slogan is not meaningless, but is backed by a determination to carry out that ideal in all that the words imply.

When this employment service was first started much criticism was directed against it from many quarters. Now although the exploiters of labor are still fighting the system, open criticism is no longer heard. Men are learning to respect an institution that provides adequate employment service without charge. They are learning that in this bureau they have a sure refuge in times of financial stringency. In times of shipwreck or other marine emergency they find here the means of rehabilitation with no loss of self respect.

Possibly the most popular service rendered to the men by the employment bureau is that of free information and adjustment of disputes as to wages, overtime, bonus payments and a multitude of other difficulties. Information as to the rights and privileges of the various ratings aboard ship; information as to legal status in the immigration offices, information as to services due from marine hospitals is all provided freely and the information is found by the men to be authentic and reliable. So through this bureau a new appreciation of service is gradually being developed at the port of San Francisco and up and down the Pacific Coast.

Pacific Coast Oil Tankers

The Story of the Development of the Bulk Oil Carrier With Particular Reference to American-Owned Tankers on the Pacific

By J. C. Rohlfs, Manager
Marine Department, Standard Oil Company (Calif.)

J. C. Rohlfs.

THERE is probably no chapter in marine history that has unfolded so rapidly as that which outlines the development of the oil tanker. There are few who realize that the oil carrier of today had its beginning but 46 years ago.

Less than three-quarters of a century back whale oil was highly prized as an illuminant. The far flung search of the old whaling ships rapidly brought about such a depletion of supply that the manufacture of kerosene from crude oil took on a most important aspect. As production of the substitute illuminant grew it became necessary to seek foreign markets. This gave rise to the first export movement—an experimental shipment of a few wooden barrels filled with kerosene, consigned from Philadelphia to London in the year 1860. Fortunately the barrels retained their contents. The following shipment comprised a complete cargo of 900 barrels. The loading of this cargo was painfully slow and considered so dangerous that it was difficult to obtain a sober crew. The shipment, however, proved a success and was followed by a rapid increase in transoceanic oil shipments.

Cases replaced barrels as containers because they packed closer, but both of these containers were subject to leaks with consequent loss of oil. Leaks also generated dangerous gases in the hold of the vessel, creating an ever present fire hazard.

First Bulk Oil Tanker

In 1880 the late Wilhelm Riedemann of the German American Petroleum Company, Hamburg, purchased a particularly staunch and fast sailing vessel, the Andromeda, built originally in 1864 for the American Northern States in their war against the South for the purpose of catching slave traders. This vessel had a large cylindrical water tank which went through the various decks from practically the bottom of the ship to the upper deck. With a view to reducing leakage Mr. Riedemann used this tank for carrying oil.

Five years later he installed in the ship 40 steel tanks which were connected by pipes. This resulted in considerable economy due to increase in cargo carrying capacity of 42 per cent and quicker loading and discharging. The loss from leakage was also materially reduced, but sufficient oil still seeped through the tanks to generate dangerous gases which filled the spaces between and beneath the tanks and the hull of the ship. This resulted in heavy repair expense as electric lights had not yet been brought into use and no hot rivets could be driven until the gas in the hold of the vessel had been eliminated at great delay and expense.

Having in mind the elimination of these difficulties, Mr. Riedemann conceived the idea of building a steamer for the exclusive purpose of carrying oil (in bulk) next to the skin of the ship.

No shipyard in Germany would accept such a "crazy" idea. Armstrong, Mitchell and Co. of Newcastle-On-Tyne, England, fell in with the plan, however, and in 1885 the first vessel that may be considered an oil tanker was built. This ship, the Glueckauf, was 300 feet long and carried 25,000 barrels of bulk oil. Her successful operation resulted in the immediate construction of several other similar vessels. By 1891 between 70 and 80 bulk oil carrying ships had been put into service.

First American Tanker

The first American tank steamer, the steamship Standard, was built to the order of the Standard Oil Company in 1888 by Joan Roach of Chester, Pennsylvania. Seven years later an explosion set the vessel afire, but

THE FIRST PACIFIC TANKER

The steamship, George Loomis, built by the Union Iron Works, San Francisco, in 1896, for the Pacific Coast Oil Company, was the first seagoing tanker on the Pacific. Her dimensions were 186 feet 2 inches length, 27 feet 3 inches beam, 17 feet 3 inches depth, and her measurements 691 gross tons and 401.9 net tons, with a displacement of 1457 tons on a draft of 14 feet 9 inches. She had a triple expansion engine and one Scotch boiler, which drove her at a speed of 9 knots. She carried 6500 barrels of oil.

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TANKER BARGES

The long distance between ports on the Pacific makes the towing of large barges by tankers a very economical proposition commercially. The illustration herewith shows the steam tanker Richmond and the Standard Oil Barge No. 95 in the Hunter's Point Dry Dock, San Francisco. This combination in June 1925 made a towing trip around the world, and during the war made five trips to England through the submarine zone. Both vessels are still in service. The high speed demanded today is gradually eliminating the tow barge.

the hull was saved and is still in service as a tow barge.

First Pacific Coast Tanker

The first ocean going tanker employed on the Pacific Coast was the steamship George Loomis, built by the Union Iron Works in 1896 for the Pacific Coast Oil Company and acquired in 1900 by the Standard Oil Company. This vessel had a capacity of but 6500 barrels, which is but little more than half the capacity of one of the ten main cargo tanks of the company's present steamship F. H. Hillman. From this small beginning the American Pacific Coast owned tankship fleet has grown until it now numbers 57 harbor and river craft and 61 ocean going vessels, with a combined carrying capacity of 4,040,218 barrels.

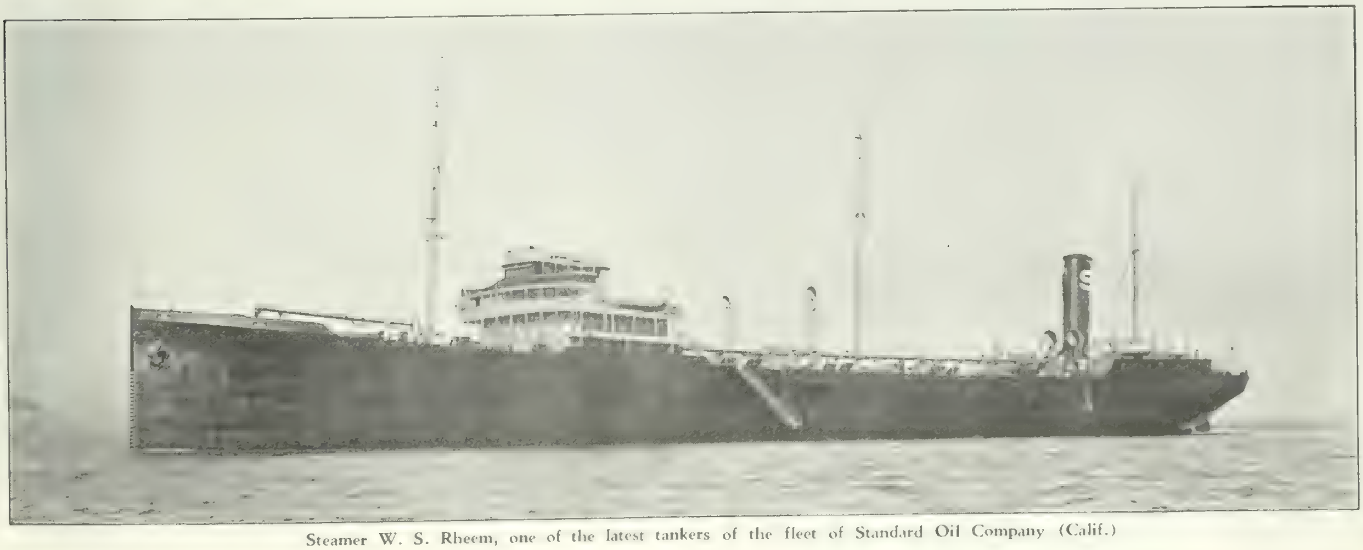
The size of tankers operating on the Pacific Coast was governed mainly by the demands of the American coastwise oil trade. Because of government protection no foreign vessel could enter this trade and for this reason the large tankers now seen loading at Pacific Coast oil terminals were comparatively slow in developing.

Tow Barges

Coastwise trade, however, developed the use of ocean-going barges which were towed by the tank steamers. The purpose of the tow was to utilize the motive power of the steamer for the barge. In this way two cargoes were delivered on one voyage. The towing vessel was equipped with a towing machine which automatically took or gave the 1800 feet steel towing hawser as strain developed. In this way the danger of sudden tension parting the "string" was avoided.

In June 1905 the steamship Richmond, a Pacific Coast owned vessel, towed barge S. O. Co. No. 95 around the world. At the outbreak of the late war these two vessels made 5 trips to England through the submarine zone. Both vessels are still in service today. The chief objection to the tow barge is the reduction in speed of the towing steamer caused by dragging the heavy barge through the water. Although some tow barges are now in use the high speed and rapid turn-around demanded of tankers today are combining to bring about the passing of the tow barge.

With the outbreak of the World War foreign countries requisitioned their own tankers for their own use. This left American oil companies in sore straits for tonnage and an era of American tanker construction



Steamer W. S. Rheem, one of the latest tankers of the fleet of Standard Oil Company (Calif.)

was ushered in. The production of crude oil in Mexico, substitution of the tanker for the shore pipe line systems wherever possible, and the tremendous growth of the oil industry, paralleling that of the automobile industry, called for a marked increase in carrying facilities. These factors resulted in a material increase in the size of tank steamers. The ocean-going tanker in general use on the Pacific Coast today ranges in size from 10,000 to 15,000 deadweight tons and delivers from 65,000 to 112,000 barrels of oil per voyage. Even larger ships, ranging in size up to 140,000 barrels capacity, are loaded at Pacific Coast terminals.

Tanker Turn-around

Coincident with the increase in size of the American tanker has been a marked decrease in the time required to handle these vessels in port. Contrast the 4 or 5 days required to load a cargo of 6500 barrels into the George Loomis, the pioneer tanker of the Pacific Coast, and the 6½ hours required to load the steamship H. M. Storey, with 110,000 barrels of oil. An almost corresponding development has taken place in the discharging capacity of tankers. It is not uncommon for a 15,000 deadweight ton vessel to completely discharge its cargo and turn-around within a period of 18 hours. The steamship H. M. Storey, for example, discharged 101,000 42-gallon barrels of fuel oil into the government's terminals at Balboa March 18, 1926, in 14½ hours.

Any discussion of oil carriers on the Pacific Coast should include mention of the case oil sailing ships used in the Oriental and Australian trade. Included among these vessels were the John Ena, a four-masted steel bark, and the full rigged steel ship Dunsyre. The oil trade also saw the four-masted auxiliary schooners La Merced and Oronite, which were operated in the case oil trade between San Francisco, Australia, and New Zealand. Case oil carriers to the Antipodes have, however, given way to the tanker. The first shipment of bulk oil to Australia was carried by the motorship H. T. Harper as recently as 1924.

An attempt was made during the war period to build tankers of concrete. These ships were not entirely satisfactory as hull cracks appeared which required frequent repairs. Often these repairs were needed in localities where there were no men sufficiently skilled to do a satisfactory job. The steel hull tanker withstands many a dent and jar before she is compelled to lay up. A further handicap to the concrete tanker is the greatly increased weight of hull as compared with a steel hull of the same carrying capacity.

TANKERS AT SEA

On account of the comparatively low freeboard of ocean-going tankers when fully loaded, these vessels present unusual opportunities for making photographs of wave action. On this page are shown two snaps taken on board the steamship A. F. Lucas of the Standard Oil Company (Calif.) while bucking into the head seas off the northern California coast. At times only the superstructure fore and aft, with the safety walk between them, show above water.

Diesel Developments

The most outstanding development of recent times in the search for greater tanker efficiency is noted in the efforts to secure cheaper propulsion. Although it is a far cry from the old sailing vessel Andromeda, with her one cylindrical tank, to the modern tank steamer with her quadruple expansion steam engine, the development of direct diesel and diesel-electric drive has been of striking importance in tanker development. Saving approximately two-thirds in fuel consumed and carrying increased cargo due to decrease in space required for bunker requirements, this type of drive, particularly the diesel-electric, is proving very economical.

The first all American diesel built tanker was originated on the Pacific Coast by the Standard Oil Company, when the motorship Charlie Watson of 15,000 barrels capacity was launched by the Union Construction Company, Oakland, Calif., August 14, 1920. The Werkspoor type engines for this vessel were built by the Skandia Pacific Oil Engine Company of Oakland, California.

Diesel-Electric Drive

The Standard Oil Company also developed the first all American built diesel-electric drive tanker, the motorship Standard Service, put into commission March 29, 1923. The hull of this vessel was built by the Bethlehem Shipbuilding Corporation at San Francisco. The propulsion power is generated by two 6-cylinder, 4-cycle, Pacific-Werkspoor diesel engines supplied by the Pacific Diesel Engine Company of Oakland, California. Each engine is coupled directly to a direct current generator and exciter located on the same shaft. Mounted on the engine and driven from its own shaft are the circulating, bilge, fuel oil transfer, and lubrication pumps, together with a compressor which provides the necessary high pressure injection air used in operating the engines. This compressor also provides a supply of starting air. Current from the generators is led to a propulsion motor unit which drives the tail shaft and propeller.

With this installation the engines always run in the same direction irrespective of the vessel's progress or maneuvers. The ship is operated by what is known as pilot house control, which is very similar to the operation of a trolley car where the motorman has complete control from the front platform. The engine room is comparable to a land power installation designed to develop electricity. All changes in speed or direction

SHALLOW DRAFT TANKERS

For many years special bulk oil carriers designed for serving industries located alongside shallow waters or on river frontage, have been built in Pacific Coast shipyards. The first of these shallow draft tankers were driven by steam engines. For a time gasoline provided the motive power. Today the diesel engine is the standard for this particular application, and diesel-electric drive is fast becoming the favorite. We show here San Francisco Bay Associates of the Associated Oil Company, which is driven by 110-horsepower, 3-cylinder Union diesel engines built by the Union Gas Engine Company, Oakland, California.

of the ship are controlled from the pilot house by varying the supply of current to the driving motor. The engine room telegraph signal system used to transmit orders from the bridge to the engine room on steam vessels is conspicuously absent. Direct control of the rudder and propeller speed from the bridge eliminates chance for confusion in transmitting pilot house signals to the engine room. It also makes for more skillful and rapid maneuvering as it avoids the delay incident to signalling the engine room throttle. Improved control of the ship's movements results in safer navigation, particularly in restricted waters.

Tanker Auxiliaries

Although the great bulk of oil carried by tankers today is transported in liquid form, there still remains a considerable demand for products which have to be shipped in cased or package form. Provision is made for this service by setting aside a portion of the ship for carrying package goods. Electrically driven cargo winches, singly manned and driven by the ship's own power, are located directly over specially designed hatches to permit the rapid loading and discharging of package freight. Special booms installed for handling both package goods and cargo hose, are particularly useful when discharging at berths where the tide causes the ship to rise and fall a considerable distance.

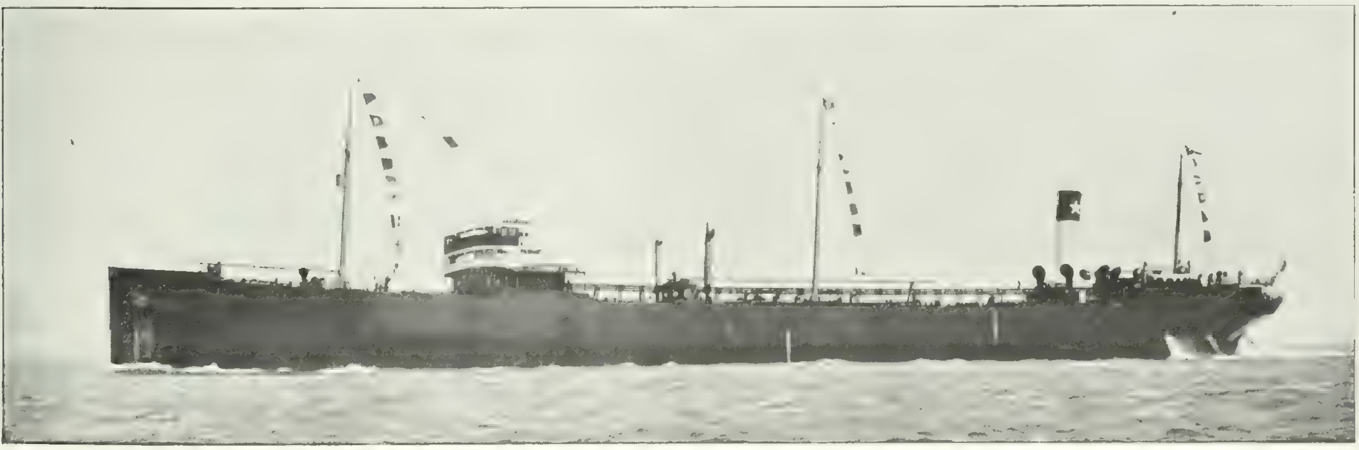
Outstanding progress has been made in arranging tanks, pipe lines, and connections within tankers which permit the ship to carry and pump more than one grade of oil at the same time. The motorship Hawaiian Standard, for example, can load or discharge four different grades of oil simultaneously. Such specialization gives flexibility of operation and materially increases the usefulness of the vessel.

Tankers for Special Uses

Not only have large tankers been developed for use in the coastwise, transpacific, intercoastal, and transatlantic trade, but small tankers have been constructed for special use at the principal Pacific Coast ports. Every effort has been made to use the waterways for oil transportation. Harbor and river craft have been particularly specialized to meet the peculiar demands of the service to which they are assigned. The oil barges at San Francisco, Los Angeles, and Seattle which are used to supply bunkers to vessels are equipped with specially designed pumps built to transfer fuel oil to the customer's bunker tanks in a minimum of time. Vessels operating on the Sacramento and San Joaquin Rivers are necessarily shallow draft craft which are able to reach the ports of Stockton and Sacramento. These vessels carry both oil and package goods. Vessels built for the Alaska service are fitted to carry both refined oils and heavy oils, together with package goods. Wherever water is available every effort is made to use the tank ship, as experience has shown that this method of transporting oil is the cheapest known.

Living Conditions

Improvement in tanker construction has been accompanied by improvements in living conditions aboard ship. The sailors on the old George Loomis were all quartered together in the forecastle. Food had to be carried from the galley in the after part of the ship to the crew's quarters, an operation of considerable hazard in a heavy sea which did not particularly aid in serving hot appetizing meals. The modern oil carrier has quar-



The steam-driven tanker Tamiahua, built by The Moore Dry Dock Company of Oakland, California, for the Southern Pacific Company. The Tamiahua is the largest tanker ever built on the Pacific Coast, having a capacity of 125,000 barrels of oil.

ters for the crew located in the after part of the ship, a far more comfortable arrangement. Two or three men now share a single room, which is steam heated and supplied with fresh running water. Showers, washrooms, libraries, the best of food kept in first class condition by refrigerating facilities, shortened working hours, and extension of shore employment benefits to sea personnel, including such features as vacations with full pay, sickness benefits, participation in stock acquisition plans, and pensions, are all innovations of the last two decades.

Tankers are now equipped with hospitals, medicine chests, and surgical supplies. Captains and other licensed officers are required by law to pass first aid examinations which qualify them to administer medical attention in emergency cases. Wireless companies have cooperated in arranging to transmit by radio the best medical advice obtainable upon call for help from a vessel.

Especially noteworthy are the efforts that have been made to sell the "Safety First" idea to tank ship personnel. Posters urging the use of goggles in the engine room or machine shop, showing how to climb a ladder safely, how to lift heavy weights without strain, and driving home the necessity for increasing vigilance against fire have been posted on bulletin boards for the purpose of educating all concerned. Careful attention has been given to equipping ladders with handrails, providing safe gangways, and installing guards around dangerous machines. All accidents are carefully studied and reported upon with a view to preventing recurrence.

The inflammableness of the products transported by tankers creates a constantly menacing fire hazard. Every effort is made to safeguard lives and property from this danger. No naked lights are permitted aboard or around the ship. All lights in close proximity to tanks or other places where gaseous vapors may accumulate are covered by airtight glass globes. Smoking is restricted to officers' and crews' quarters. No engine room or galley fires are permitted aboard ship while loading the more volatile products. Repair work to tanks or bulkheads is not started until the tank spaces are certified to be gas free by a competent chemist. In case it is necessary to send men into tanks before they are known to be entirely gas free gas masks are provided as a precaution against possible asphyxiation. Those working in tanks are required to wear rubber sole shoes to prevent sparks from igniting any gas pockets. Tools of special metal which will not create sparks are used whenever work is done in spaces which may contain gas accumulations. Much thought has been given to developing an efficient type of fire-fighting apparatus, and tankers today are equipped with steam smothering lines, fire screens, and fire foam system. But most important of all is the effort made to impress upon all personnel the urgent necessity for constantly guarding against fire.

Much has been done to develop mechanical safety devices and aids to navigation. These features include the electric sounding machine for determining depth of water and nature of bottom; electric indicators for rudder and engines which show the angle of the helm and speed and direction of the propeller; radio compasses and direction finders for taking bearings and fixing vessel positions in thick or stormy weather. Some of the larger ocean-going vessels are equipped with the Gyro compass and Gyro pilot, more generally known as "Metal Mike." These devices enable the vessel to steer a truer, safer course and automatically record the ship's movements on a chart which may be examined by those interested in securing maximum efficiency.

With the large oil companies of the country making every effort to seek new sources of crude in distant countries and a continuing growth in consumption of petroleum products, it can readily be understood that the tanker's position in the shipping world will be one of increasing importance. But regardless of the future, the Pacific Coast may well take pride in reviewing the part it has played in developing this highly specialized type of vessel to its present usefulness and efficiency.

General Petroleum Company's new motor tanker Lio, recently converted by the Bethlehem Shipbuilding Corporation at their San Francisco plant from steam to diesel engine drive.

The South Pacific

Special Correspondence

THE burning question in shipping circles in Australia today is the provision of fast freight service to Europe. In recent times certain lines, both British and foreign, have put steamers and motorships on the loading berth for wool on a non-stop schedule to Dunkirk or Hull. As a result passages of 32 days and up to 35 days have been made, and shippers having had a taste of these sweets, which were attained as a result of rivalry between British and foreign lines, demand fast dispatch always.

The rivalry referred to arose after the war when the British lines found that the carriage of wool to the Continent which formerly was as much their prerogative as that of Continental lines had fallen entirely into the hands of French, German, Dutch, and Norwegian lines, while the Italian Government, having undertaken the handling of all wool imported into Italy, insisted that it must be carried by the Italian ships which are heavily subsidized. The Dutch and Norwegians got their grip on the trade by using fast motorships, and today most of the big cargoes for Europe go by these liners.

Bringing Australia Nearer Europe

Another factor which has caused the outcry for fast services is the carriage of chilled meat. Hitherto Australian meat has been carried frozen, as the time taken by the average freighter was too long to insure the delivery of chilled meat in a sound state. In the last three years this matter has become more urgent. A British line has made several experimental shipments of chilled meat, which have been successful enough to warrant their continuance on a larger scale. Competition with Argentine meat, especially beef, has prompted this new departure, for the color of chilled meat when marketed is vastly better than that of the frozen, apart from the prejudice against frozen meat which prevails in many markets. Since chilled meat requires more space on shipboard, owing to its having to be hung to allow air to pass between the carcasses, more cheaply-operated ships are required. The motorship seems to meet the case, and the Blue Funnel and Cunard lines are already running several vessels of this type.

At present most of the meat is shipped from eastern and northern ports, but occasionally a cargo is taken from the northwest, which is considerably nearer Europe than the eastern ports. One scheme involves the establishment of considerable works at King Sound in northwest Australia and the use of fast motorships to make the passage from there to London, via Suez Canal, in 26 days. Eventually this will be accomplished and this is another spur to the eastern ports to get into closer contact with Europe, for the northwest of Australia is a vast and fertile territory, which could grow all the beef required for shipment for some years to come.

None of the Australian ships bound for England use the Panama Canal as it is shorter by Suez, but practically all the New Zealand liners bound for Europe travel by Panama. As a result the meat ships of the two dominions rarely make calls at both countries.

While the freight services are likely to be speeded up, another movement is afoot to quicken the mail and passenger services, the ships of which at present take about 40 days to reach Europe. The latest proposal is for ships of 22 knots and 24,000 tons to run between Sydney and London in 28 days. The difficulty with all services via Suez is that they call at three Australian way ports to load and discharge cargo, and these stops cut down their time. A bright suggestion made by an Australian shipping man is for the mails to be carried from Sydney to Fremantle, 2000 miles west, by airplane, then placed on fast ships for Port Said, where more planes would take up the running to London. In this way it is claimed that the mails could be delivered at the other side of the world in 18 days.

All suggestions so far have only dealt with freight and mails. Passengers, it is thought, prefer to have several calls en route, as mostly they are tourists. Those who are in a hurry can use the railway in Australia and Europe to expedite their transportation, or go via San Francisco or Vancouver.

It must be conceded, however, that all this talk of speeding up the Suez services must react on the fast Pacific lines, which rarely exceed a speed of 17 knots, while less than that is called for in the mail contracts. One of the present liners, the Aorangi, could, if desired, cross the Pacific in 14 days instead of 22 as at present, but this would make a heavy cost in oil and in overtime working freight in way ports. Within a few years it is recognized that such speed will be demanded, while the carriage of mails by airplane across the United States would further quicken that mail route. The Malolo may yet be pressed into the Australian service, and it is fairly certain that another Aorangi will be on the route ere long.

It is a significant fact that when the Suez lines are slack in passenger traffic, owing to what is called the "off season," the Vancouver boats scarcely ever show any diminuation in passengers, and the San Francisco lines would not either if the immigration restrictions in the United States were relaxed to favor through first-class passengers bound for Europe. While Mexicans have fairly free access to the United States it puzzles Australians why through passengers of undoubted standing are harrassed by cast-iron laws when they land at San Francisco.

The Export Triumvirate

COTTON, automobiles, and gasoline are disclosed as the triumvirate of leading American exports in an analysis of foreign trade made by the Department of Foreign Commerce of the Chamber of Commerce of the United States for the first half of 1926.

Cotton maintains its supremacy as the chief item, with an export value for the six months of $324,886,000. This, however, represents a decline of 30 per cent from the same period last year. Automobiles, parts, and accessories, not including tires, come second with $172,591,000, an increase of 8.5 per cent. Gasoline, naphtha, and other light products rank third with $137,542,000, an increase of 43 per cent.

Striking changes occurred in the order of other important exports. Wheat, our fourth chief export a year ago, is now in eleventh place. Wheat flour declined from ninth to fifteenth place. Lard advanced from sixth to fifth place. Agricultural machinery and implements went from fourteenth to eighth place.

Red Stacks Black Stacks and Griff's

BAY and coast towboating, with San Francisco as a base, began to be a factor in Pacific Coast shipping with the first rush of sailing ships after the California gold discovery. But it was not until grain and lumber began to be exported in volume, with importations of coal and merchandise, carried by sailing vessels, that towboating attracted the attention of maritime men as a commercial business with a great future.

Among the first towboats on San Francisco Bay was the Merrimack, built at North Beach about where Pier No. 37 now stands. This craft was small, with high pressure engines. Her exact dimensions are not available, but she was about 60 feet in length. Her captain's name was Mark Harlow and he long ago coiled down his last towline.

The attractive profits of the towing game soon drew other craft to San Francisco, and in the early 60's the Sol Thomas, Captain Jack Winthrop, and the Lookout, Captain White, with Engineer Hugh May, came out from the East Coast under sail. These were screw boats, as was the Merrimack. A side wheel tug, the Goliah, was added to the fleet, and a rapid gathering of similar craft soon made San Francisco a hailing port.

The Donald, built by the United States Government as a gunboat during the first years of the Civil War, was bought by Chapman & Adams, rebuilt, and used by them as a tug. This firm soon added the tugs Holyoke and S. L. Mastick to their fleet. These two were among the first to have condensing engines, enabling them to make long distance tows at sea which the high pressure tugs could not do. It is a matter of record that the Mastick was the first tug to bring a ship from San Diego to San Francisco. This ship, the name of which escapes the old timers, was to load at San Francisco, having discharged cargo at San Diego. Being light it would have taken many weeks to beat up to the northern port, and a rich freight awaiting her at San Francisco, the Mastick was sent to tow her north, and did the job in good time.

Captain Millen Griffith built the tug Rescue, first of the name on San Francisco Bay, which was lost on North Head. He also built the Monarch, which had the first compound engine installed on a Pacific Coast tug. The tug Wizard was built and owned by Goodall & Nelson, the predecessors of Goodall, Nelson & Perkins. The Wizard had a very peculiar engine, built by Lockhead in San Francisco. This engine had a single cylinder driving two screws. The cylinder was vertical, with the piston rod operating a very heavy crosshead built of plate iron and weighing nearly half a ton, which worked on two heavy vertical guides and extended beyond both sides of the cylinder. From the outboard ends connecting rods reached down to the cranks of the shafts one on either side. These two shafts were geared together, so that they revolved in opposite directions and always at a common speed. There was no go ahead on port or back up on star board with the Wizard.

Captain Goodall was the founder of the tugboat business in the days when San Francisco was young. He soon saw that there was a big future for coastwise trade, and was the one man to whom the starting of the Pacific Coast Steamship Company is due. Though he retained his interests in the towing business, he later devoted all his energy to the building up of the coastwise steamship trade. Nothing daunted, he kept at the task in spite of all disasters, his fleet of steamers grew rapidly, and for many years the company had a virtual monopoly in the coastwise business. Captain W. G. Gray has a most profound admiration for Goodall, believing him to have been one of the prime factors in the building up of early San Francisco's water-borne business and the ablest steamship operator of his time.

The old tug Favorite, owned by Captain Charley Groeper, was an independent tug which did good service in the grain fleet days, and it may be mentioned that Captain Groeper's son is now one of the oldest employees in active service with the Redstack tugs, having been a towboat man from his childhood, learning from his father,

Captain W. J. Gray

Tows, Tugs, and Towboats

A Few Notes on the Developments of the Towing Business on San Francisco Bay compiled by Chief Engineer Wm. P. Lindley collaborating with Captain W. J. Gray and Captain George H. Harvey

who is said by the old hands to have been one of the best in the business. Besides the Favorite, there were several other independent tugs, Captain Canfield building the first Neptune at the Old San Francisco Drydock Company's yards in the early 70's. The business sagacity of the late Captain Goodall, however, prompted him to form a combination of several of the smaller operators, and the fleet of Redstack tugs was started in 1882. Captain Griffith still remained active and independent.

In 1884 the late John D. Spreckles went into the towing business, and the three principal fleets fought hard for the towing business of San Francisco Bay and the Pacific Coast. The war even extended to northern and southern ports, and many were the exciting races to pick up ships at sea. After some four years of this, Griffiths and the Redstacks consolidated, leaving only Spreckels with the Blackstacks as a big competitor. The war continued between these two fleets until 1904, when Spreckels found it too expensive to combat such skillful tugboat men as the Redstack forces numbered in their ranks. The Redstacks now had a complete monopoly for a time, but to the credit of the management, the rates were kept at a reasonable level. A splendid business was built up, well known among seafolk from all parts of the world. In 1918 the fleet was sold to the Crowley Launch & Tugboat Company, which has since operated it.

The above sketch is but a brief outline of the growth of towboating out of San Francisco. To mention all the various boats and firms would require much space. However, a few details concerning the old towboat days will perhaps be of interest.

The personal equation, then as now, was a prime factor in the success or failure of any undertaking. Towboating, perhaps, calls for more resourcefulness, skill, courage, and quick action than any other maritime work, piloting in dangerous channels alone excepted. The men who were outstanding in the game have mostly "gone across the bar" for good, but a few remain.

Outstanding among surviving towboat pioneers is Captain W. J. Gray who, after a busy life, is now in the twilight of his years, one of the most striking personalities in San Francisco. Tall, vigorous, and of most courteous bearing, he is one of the old school American Captains. Loath to speak of his own past as anything out of the ordinary, he is always ready to extol the ability of those who for years fought opposition and physical difficulties to bring victory from seeming defeat. Among the many men of whom he speaks highly are Captain George H. Harvey, Captain Dan Thompson, Engineer Pete Anderson, Engineer William Hannell, Captain George Enos, and Captain Bob Rassmusen, all of whom he has known for some fifty years past. Besides these he is particular to mention John Curry who entered the Redstack employ in 1885 in the office force and was secretary of the company when it was sold to the Crowley interests. Mr. Curry is now associated with Captain Gray in shipping affairs and is an authority on marine questions.

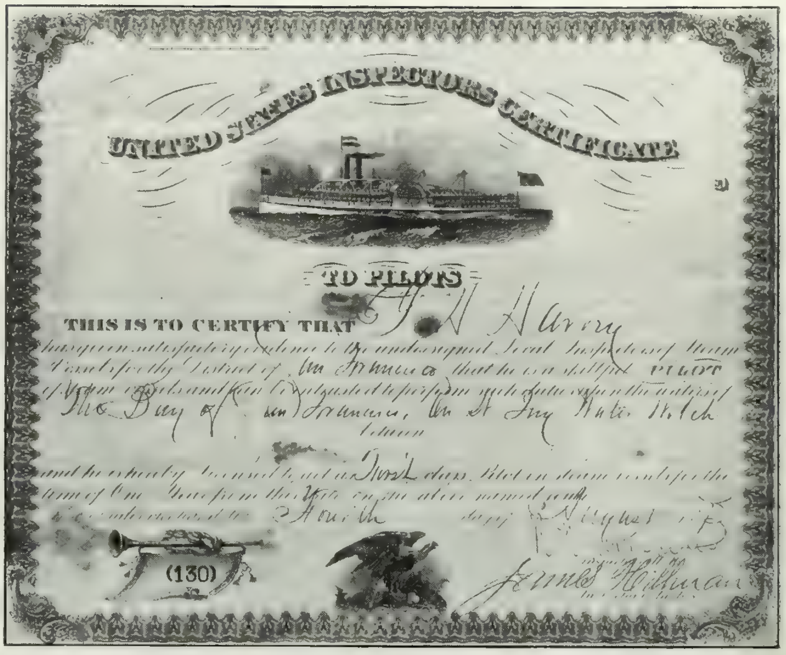
Captain George H. Harvey

Captain Gray was born in New York and served in the United States Navy for an enrollment, being honorably discharged by Commodore Poor, under whom he served. Soon after that he became identified with the towboat business in San Francisco. To his ability and management was largely due the prosperity of the big company he so faithfully served through so many years.

Captain George H. Harvey was born in New Hampshire and came to the West Coast when 14 years old. His first seagoing was on the schooner Montana. This vessel was built in San Francisco by Benjamin P. Harris, who afterwards built Long and Commercial wharves. Young Harvey left her and started towboating soon after, taking to it like a duck takes to water. He obtained his pilot's license in 1873 and was the first master of the tug Wizard and later on the Water Witch, which he owned. He was with many of the old companies for years, and during this time was often opposed to Captain Gray in a business sense. These men would combat each other when working for a job towing, but personally they were great friends. So when the Redstacks absorbed the Blackstacks, Captain Harvey was taken in with the fleet, and Captain Gray, when he was made manager in 1887 gave Captain Harvey command of his favorite tug, the Monarch.

Many and interesting are the stories these old time tugboat men tell of the days when nerve and skill alone turned the trick. Opposition served to sharpen wits, and besides being seamen of the highest type, the tugboat captains had to be diplomatic business men as well. A case in point was when a sailing ship got in too close to the shore just outside the Heads. Captain Harvey happened to sight her and went alongside. The captain and pilot were right glad to welcome the tug, as the sailing craft was mighty near the rocks. However, with the caution of a down-easter, the captain of the sailing craft would not permit of a towline being put onboard until a figure for the job was made by Harvey. Harvey noted that the tide was falling, and said he would be willing to leave the matter to the admiralty courts. This the sailing master would not agree to, as he contended his ship was not aground and in no immediate danger. But as the chaffering was going on, a slight swell began to set in, and Harvey noticed that the ship was touching bottom as the spars would shake and quiver occasionally. The captain of the ship became a bit anxious and again asked Harvey for a figure. The price of ten thousand dollars was asked. The sailing master thought this too high and agreed to let it be settled later. The tow rope was put on, and in a few minutes the ship was out of danger and anchored in the bay.

Another time when Harvey was in command of the Rescue, bringing a deep grain laden ship down from Vallejo, the connecting rod of the Rescue's engine broke off short near Red Rock. The engineer, Harry Burleman, narrowly escaped death from the swinging mass of steel but got steam shut off with no hurts to himself and crew. The cylinder was badly cracked in the mixup and other minor damage done, so another tug was engaged to haul the ship and the disabled towboat to San Francisco.



UNITED STATES INSPECTORS CERTIFICATE

TO PILOTS

THIS IS TO CERTIFY THAT G. H. Harvey

PILOT

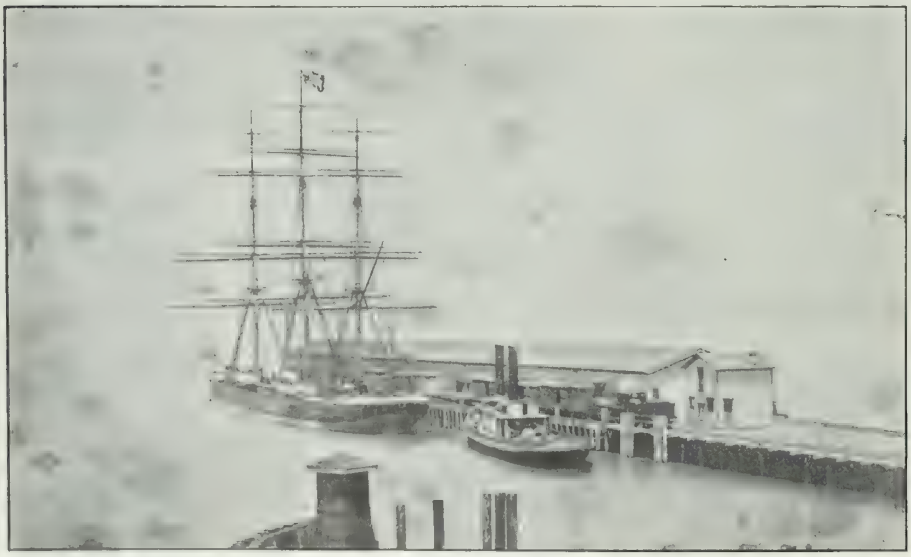
(130)

James Hillman

The pilot's license issued to Captain George H. Harvey in 1873

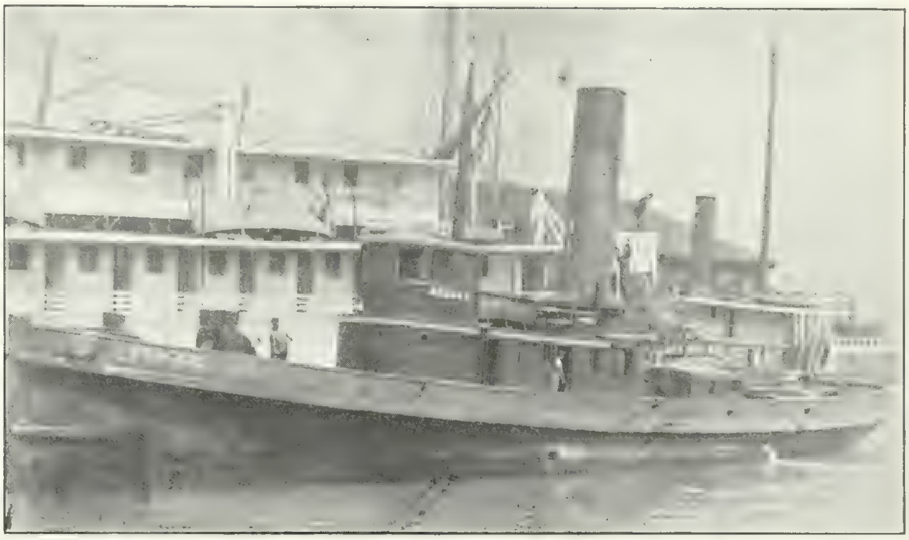
All these incidents were a part of the day's work. And the day's work then was as a rule a long and busy one. As an instance of this the log of the tug Rescue in August, 1881, shows that the vessel made forty bay moves. That is, she docked from anchorage and took from dock to anchorage, forty vessels. She towed eleven ships to Vallejo for cargoes of grain, and towed from Vallejo to San Francisco nine others. Besides this she towed to sea from the bay six more big ships, and towed one in from sea. All this in one month. Outside of the jobs mentioned she had nothing to do but take on coal, water, food, and engine room stores, besides attending to the regular routine work. And August of 1881 was not a specially busy month, just a fair average. In those days San Francisco Bay had many sailing ships coming from all of the seven seas. Tugs were kept busy, and the fleet made money, although prices for towing were only about one-third of the present rates.

Sometimes a tug was sent to San Diego or some port north or south for a tow, and then it was customary to



OLD TIMERS

This old photograph, published through the courtesy of Captain Harvey, shows Millen Griffith's tug Monarch ready to pick up the ship Eaton Hall at Benicia, May 24, 1881. The Monarch had the first compound steam engines installed on a Pacific Coast tug, and was long a great favorite among towboat men and ship owners. The engines of the Monarch were of the poppet valve type built by Pusey and Jones, Wilmington, Delaware.



A STURDY SALVOR

One of the famous deep sea tugs of old San Francisco was the Rescue, shown in our illustration. For several years she was under command of Captain George Harvey, and in the palmy days of the grain fleet showed records for monthly towing service that would be very difficult to match today. The Rescue was originally a high pressure job, and later on changed to condenser.

put a lot of coal on deck as well as have the bunkers full. The tug Holyoke, at the time under command of Captain Harvey, was sent to the south and the usual extra coal put on. Coming back, when off Point Conception, the engineer reported to the captain that the coal was getting short. As Harvey had been in the boat for considerable time and knew about what her consumption of fuel should be, he felt the engineer was wrong. However, he had a look over the situation, and afterwards told the chief that there would be plenty of fuel. And it turned out to be true, for after making San Francisco Holyoke did work around the bay for four days before coaling.

Tugboat men in those days had to consider the whims of the masters of sailing vessels. In one case the ship Highland Light was to be towed to Point San Luis. The captain of the Light told Harvey that he did not want any alongshore courses, but wished to keep well out to sea. As the job was a contract one, and Harvey knew the Coast well, not much attention was paid to the sailing captain's desires. The sea was smooth and weather clear, and Harvey ran from point to point as is usual with coast work. On arrival the captain of the ship was somewhat peeved, and Harvey told him that they had not been in close at any time. The sailing man thought otherwise, but let it go by remarking, "Well, when you do take a notion to go in close, I hope my ship is not being towed by you."

Millen Griffith's tug the Neptune

Particulars as to the characteristics of these old time tugs are difficult to obtain, but Captain Harvey has kindly given the writer the Water Witch's figures. This vessel was about 60 feet length, by 18 feet beam, and 7 feet depth. Her engine was what was then known as an "eighteen inch square," that is, it was a single cylinder of 18 inches diameter and 18 inches stroke. It was high pressure, and steam at 100 pounds pressure was generated in a plain return tubular boiler set in brickwork, much the same way as sawmill boilers are arranged.

Of the tug Vallejo particulars are meager, but she was about 150 feet length, 26 feet beam, and 10 feet depth. She had a locomotive boiler, with an engine 24 inches diameter of cylinder and 24 inches stroke, and was a powerful tug.

The engines of the Monarch and Tacoma were built by The Pusey & Jones Company, Wilmington, Delaware, and were of the poppet-valve type. They had a long stroke, 54 inches, that of the Tacoma having a 26-inch cylinder, and that of the Monarch a 28-inch cylinder.

A Fraudulent Agent

The trade in general and individual prospective buyers of marine gasoline engines in particular are hereby warned to be on the lookout for one Charles Judson Feldmiller, or Miller, as he is also known; representing himself to be either or both a representative of The New London Ship and Engine Company, New London, Conn., and the King Knight Company of San Francisco, Calif. This man is wanted in San Francisco for passing worthless checks and obtaining money under false pretenses. He is in possession of some King Knight Company stationery and a brief case also belonging to King Knight Co. DO NOT under any circumstances give this man any money as part payment on machinery he may try to sell. Mr. Feldmiller, of Miller, is six feet three inches in height, weighs about two hundred and twelve pounds, dark complexioned, prominent nose, black hair combed straight back, and has a bald spot on side of head over which he combs his hair to hide. Any one knowing this man's whereabouts please communicate with A. J. Holton care of Mercantile Trust Company, 464 California Street, San Francisco, California.

The Significance of Cooperative Effort

An Enlarged Opportunity for Maritime Prosperity on the Pacific Coast

By Norman F. Titus, Chief, Transportation Division,
Department of Commerce

THE New Year is commonly associated with the making of resolutions; it may also present an opportunity for introspection in business. If one would critically examine maritime operations on the Pacific Coast, probably no more fertile field could be found than consideration of the ultimate possibilities of cooperative effort.

Cooperation in business is not new; it has flourished in various forms since the Middle Ages. In economic history one of the most interesting developments has been the various aspects of cooperation in business. It is well worth while to examine briefly this subject because it has, today, a peculiar significance, especially for the shipping industry.

Cooperative History

Probably the earliest noteworthy example of business cooperation is that of the Hanseatic League in the fourteenth and fifteenth centuries. There were eighty towns belonging to this league reaching from the shores of the Baltic westward to the Netherlands, and inland in Germany as far south as Cologne. Under the feudal system the town has once been mostly subject to feudal lords, but they had early shown their independent spirit, and rebelled, or bargained for charters of freedom. A free town was a little republic, organized for protection from foes without and for peaceful trade within. The members of each trade were banded together into guilds for mutual protection, and from these there arose a sort of representative government —an upper and lower council of citizens, by whom the town was governed. Originally the Hanseatic League had been a mercantile league for the extension and strengthening of trade privileges and for the settlement of trade disputes. Eventually, however, there was added to this mercantile association a political and military alliance, and this led to its downfall. There are two significant things to note about the Hanseatic League, first, the organization of the guilds, and, second, the fact that as soon as they undertook political and military roles they were doomed to failure.

Guild Monopolies

Concerning the guilds, their privileges and restrictions endured until the nineteenth century. They were based upon monopoly and, being purely selfish, were attended with many evils. The privilege of monopoly was abused by limiting entrance to the guilds in various ways, so that production was restricted and prices were raised to the detriment of merchant and consumer. Laborers suffered, also, by the lessened demand for their services. Guilds came into frequent conflict over the question as to which had the right to exercise a particular branch of trade or manufacture. Promotion was granted by favor rather than by merit; laborers lost the incentive to do good work and were tempted to idleness and disorder. Any master who was sufficiently enterprising to attempt to extend his business by introducing improvements or by employing more men was pulled back into the general level. Inflexible regulations prescribed the details of every process and prevented improvement. After all the restrictions, consumers did not get good quality even when they paid high prices. They could not punish the producers of poor goods by withdrawing their custom, and skimped work, adulteration, and fraud were common.

The point to this historical reflection is that it discloses that through a long period of five hundred years mankind decisively demonstrated that cooperative effort in business based on a monopoly is a failure. It is inherently selfish and restrictive, defeats itself, and is bad for both producer and consumer.

Another interesting phase of cooperative effort is that of the working classes in the last century. Here cooperation has been tried in retail trade, in credit and banking operations, in some phases of agricultural work, and finally in production. This enumeration proceeds roughly in the order of success; cooperation has been most successful in retail trade, least so in production. The most noteworthy of this series is the great chain of cooperative stores in England. However, after all is said and done, there is nothing startling to be noticed in these measures; there is nothing that will leave its stamp on the social order. The hopes entertained a generation ago by many economists, that these were only the first steps in a far-reaching development, are now cherished by very few. Thus it has been proved for the working classes that cooperation is not the method for mitigating inequality and widening opportunity.

American Business Cooperation

We have thus seen that monopolistic cooperation in business and cooperation in its various forms with the working classes is lacking in promise or is a dismal failure. However, there exists another form of cooperation that promises tremendous success and, withal, it is a distinctly American accomplishment. Here in America we find exemplified a form of business cooperation that does not concern itself with the fixing or maintaining of prices, but is based solely on the fostering of trade on a strictly legitimate and competitive basis.

American business cooperation fosters the American manufacturers' policy of increasing the extent of his market by a continuous reduction in the cost of production. The unique feature of the idea, and this is the new American principle, is the free intercourse between rival firms engaged in the same industry for the purpose of reducing costs, introducing more efficient methods, and eliminating waste. The Sherman Law made it illegal for firms to combine for the purpose of fixing prices or otherwise forming a trust, but in the fostering of the cooperative principle society is benefitted by standardized methods and the fact that improvements are not treasured as trade secrets, but are passed on freely to all other firms in the industry. On the other hand, foreign firms cling to trade secrets and are opposed to sharing information on improved methods with others.

The spirit of facilitating an exchange of ideas and experiences in any one branch of industry is responsible for the growth of conventions and business societies, which are so typical of America. It is quite evident, also, that the great accomplishments in the campaign for elimination of waste have been made possible, to a large extent, through cooperative effort. This same medium has also been responsible for simplification and standardization of commercial documents.

To illustrate this American business cooperation, we have the case of two important manufacturers of agricultural machinery in America who cooperate on the production side of the business to a marked degree.

When one firm produces a new machine the other buys a sample and asks for detail drawings, which are supplied without hesitation. The latter firm is thus enabled to examine the machine to see whether or not it could effect any improvements. This courtesy is invariably reciprocated. Engineers from the one company's works visit the shops of the other to study shop methods, the output of machines, and many other details. The cooperation is maintained in the true spirit because both firms realize fully that swifter progress can be made in the agricultural machinery business to the obvious advantage of both firms, since there will be an increased general demand for agricultural machinery in proportion to the progress made in improvements to machines.

It is this free exchange of ideas and cooperative effort that has given American industry such a commanding lead. The question that now presents itself is: "In what manner can the example of industry be applied to the shipping business?"

Cooperation in Shipping

It might be urged that the steamship associations represent cooperative effort, but while they represent a start, nevertheless, the results are so trifling, considering the industry as a whole, as to be hardly worth mentioning. There is really no cooperative effort on the Atlantic Coast or the Gulf; there is some praiseworthy work on the Great Lakes and the Pacific Coast; but as a whole the industry has a long way to go.

The most conspicuous results have been in organized safety work; this has been actively undertaken for a number of years on the Great Lakes, about two years in the Northwest, and less than a year in California. This work is very promising and should be carefully fostered.

Other forms of cooperative effort suggest themselves. The steamship associations should maintain central organizations for settling personal injury claims for members. These would accomplish two things, first, reduce costs, and second, bring about more prompt and fairer settlements with employees and eliminate the huge contingent fees of ambulance-chasing lawyers.

The cooperative personal injury claim bureau is but a step to joint legal service. Experienced salaried attorneys would achieve great results especially in personal injury and similar controversies. The saving here would be considerable.

It is well known in the industry that medical direction is absolutely indispensable; there is also a big field in the shipping business. There is now no control over medical or surgical fees; furthermore there is no means of telling whether the men get adequate treatment or whether treatment is unnecessarily prolonged to run up big fees. Experience of compensation companies shows that this form of medical direction accomplishes splendid results and is a big dividend producer and is humanitarian as well.

Right along this line, the medical direction should commence at the beginning and men should be examined before being employed on ships. The New York City branch of the Sea Service Bureau examined 24,000 men last year and found 421 absolutely unfit and 1000 more incapacitated by minor defects which were subsequently remedied at the Marine Hospital. Obviously this form of medical direction is very valuable.

If the shipowners would carry out organized, cooperative work in safety, claim investigation and adjusting, legal work, and medical direction they would realize inevitably that their next steps would be to organize their own Protective and Indemnity Associations. With prevention work and efficient methods prevailing, there would be no logical escape from the formation of such associations. It has been estimated that such an association on the Pacific Coast would handle premiums amounting to $3,000,000—an amount to cause envy on the part of many an old established insurance company.

In other articles attention has been drawn to possibilities along the line of claim prevention with cargo or, as it is now called, freight protection. Attention was drawn to the astonishing success of the railroads who had reduced their claims from $120,000,000 in 1920 to $38,000,000 in 1925 and have fixed as a goal a fifty per cent reduction of the 1925 figure. Even the most casual observer would conclude that the shipping business offers a splendid field for similar effort.

Marine Engineering

Another point worthy of careful attention is that, although America is the greatest and most accomplished nation in the designing and construction of mechanical devices, the shipping business is far behind industry in this respect. There is abundant opportunity for the trained engineer to study ship and terminal work.

Cost Accounting

One of the outstanding achievements of industry has been the development of the science of cost accounting. This field is practically untilled in the shipping business. Many operators imagine that they have adequate cost acounting systems, but if they would examine the scientific methods pursued in industry, they would realize how elementary were their own methods. One well-known eastern operator has stated that his fleet has been kept in operation, at extremely low rates, only through a most rigid cost accounting system reducing all operations to a ton-man-hour basis. This not only compared terminal with terminal and ship with ship, but disclosed the efficiency of all workers and gangs of men. How many operators can point to such methods?

Consideration of such vital factors leads one to speculate as to whether, should the American shipowner practice such methods as have been outlined, he would not find his operating differential over foreign owners greatly reduced. Surely here is food for thought, and possibly a New Year's Resolution.

Important Announcement

THE Atlas-Imperial Engine Company desire to have especial attention directed to an important change in the prices of Atlas-Imperial diesel engines. The change will be announced in the advertisements of the Atlas-Imperial Engine Company appearing in February issues of periodicals and will be effective January 1, 1927.

It is understood that this revision of prices will be downward and it is due to standardization of design and to efficiency in shop practices combining to lower the cost of this well known Pacific Coast diesel engine.

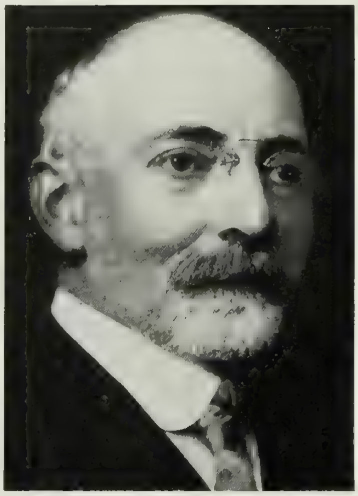
The Pacific "All Americans"

Some Observations on the Development of Marine Insurance in San Francisco

by James A. Quinby

AT FIRST blush, it may seem a far cry from a forward pass to an F. P. A. policy, and there may even be found in the uttermost hinterland, some benighted individuals who couldn't find the slightest similarity between the adjusting committee and the huddle system. Be that as it may, the history of our Pacific Coast does offer a certain parallel in its marine insurance and football departments; to wit, both professions have had a hard time convincing the erstwhile effete East that anything really worth while could have an independent growth on the afternoon side of the Rockies.

All of which brings us to the point where the leader of the chorus rises to announce that Young Lochinvar wasn't the only All-American that ever came out of the West. Not by two return premiums and a field goal. If you don't believe it, ask Brick Muller, of Charley Page, or Ernie Nevers, or C. A. Hulme.


J. B. Levison, President of the Fireman's Fund Insurance Company

The Pacific Coast has developed into world-wide prominence both as a marine insurance center and as a market for that commodity. And furthermore, such development has been remarkably independent. In no sense of the word has San Francisco been a suburb of New York.

Prior to the days of the old Gold Rush, there was little activity in the local insurance market, for the simple and sufficient reason that there was little or nothing to insure. Later, when the argosies of the world crowded our ports and the broad expanse of our central valleys rippled in waves of ripening wheat, the necessity of some means of protecting our products became apparent.

To the casual observer, it would appear natural and logical that New York would be the center toward which the new empire would turn for its coverage. But the tricks of day and night brought about a peculiar anomaly. The Atlantic Cable and the San Francisco wheat market were both doing a flourishing business. If a grain risk were offered a broker in the late afternoon, and he wired to New York for coverage, the wire would not be delivered till morning, and his answer would be delayed till late in the day. But if he wired London in the afternoon, the message would be received during working hours (unless it happened to come at tea time) and the answer would be at the broker's office bright and early in the morning.

So the names of British companies began to be known on California Street, and the British and Foreign, the Maritime of Liverpool, and the Thames and Mersey gained a foothold on the Coast ahead of the American companies.

There was, of course, an independent reason for this. The Seventies and Eighties found the age of steel in full swing. The American clipper ship was being forced from the sea. And as England built the ships, she owned them and insured them. The cargo insurance market naturally followed the hull market, and London built the foundation for her present greatness as an insurance center.

A glance at Daily Commercial News for May 14, 1880, which we reproduce herewith, makes this British eminence quite apparent. Of the eighteen marine insurance companies advertised, one only has its habitat in New York. Two are Swiss, two German, one Austrian, and the rest British or British controlled. The modern reader will find other interesting data on this sheet; notably, the number of vessels in port loading wheat, the grain export tables for 1879-1880, and the advertisements for second-hand bags and Cyrus Noble Whisky, both of which have now passed from our published import lists.

It was not long before local capital and initiative became interested in the marine insurance field, and the California, Commercial, Fireman's Fund, and Union companies were formed. The benefits of cooperation early became evident, and in 1862 the Board of Marine Underwriters of San Francisco was organized. The Board was more or less ineffectual, however, until its reorganization in March of 1865.

They took themselves seriously, these be-whiskered pioneers, as witness the solemn preamble to their table of rates published in 1869:

"We, the undersigned, Agents and Officers of the several Marine Insurance Companies and Marine Underwriters doing business in the City and County of San Francisco, State of California, do hereby agree, and pledge our honor as gentlemen, to adhere strictly to the following rates of premium and Rules of Marine Insurance."

Some of the rate schedules were commendably simple and elastic. For instance, all the stated rates were for F. P. A. coverage, but a footnote allowed partial loss to be insured, but at an additional premium of not less than 25 per cent.

It is interesting to note that in the rules on general average included in this booklet, the allowance for provisions is fixed at $1.50 per day for masters, 75 cents for mates, and 40 cents per day for seamen. Some present day adjusters might profitably study Rule V of the original board, which read as follows:

"The traditional and necessary attitude of an adjuster is that of a referee, and not that of an attorney or advocate. It is his duty in all cases to act with strict impartiality between insurers and insured, regardless of favor toward friend or employer, and intent solely upon the legal and clerical accuracy of his calculations."

Certain conditions causing sleepless nights for un-

DAILY COMMERCIAL NEWS

AND SHIPPING LIST.

Morris U. Bates & Co. SAN FRANCISCO, FRIDAY, MAY 14, 1880. VOLUME 10--No. 69.

INSURANCE.

THE SEA INSURANCE CO.

(LIMITED)

OF LIVERPOOL, ENGLAND.

ESTABLISHED JANUARY 1, 1876.

Capital Subscribed,	$7,500,000
Capital Paid Up,	$500,000
Net Surplus Dec. 31, 1878,	$370,086

RODGERS, MEYER & CO., Agents,

212 Battery Street, San Francisco.

THE MARINE INSURANCE CO., OF LONDON, ENGLAND.

Established 1836.

Whole Amount of Joint Stock and Guaranteed Capital	$5,000,000
Whole Amount of Capital paid up	900,000
Cash Assets December 31, 18[illegible]	4,481,348

The undersigned have been [illegible] authorized to issue Policies at current rates on Freight and Shipments to or from England, Europe, New York, Japan, China, Australian Colonies, Sandwich Islands, and Northern Coast Ports. If desired policies made payable at port of termination.

WILLIAMS, DIMOND & CO., Agts.

mch1-tf UNION BLOCK, Cor. Market and Pine Streets.

THE CHINA TRADERS' INSURANCE COMPANY, LIMITED.

OF HONGKONG, - - - CHINA.

Capital, - $1,000,000.

Amount of Capital Stock paid up in cash	$300,000
Amount of Capital Stock subscribed	700,000

WILLIAMS, DIMOND & CO., Agts.

jy20 UNION BLOCK, Cor. Market and Pine Streets

SHIPPING.

PACIFIC MAIL STEAMSHIP CO.

THE COMPANY'S STEAMERS will sail as follows at 12 M. Steamships.

City of Tokio .... July 1
For YOKOHAMA and HONGKONG.

City of Panama .... May 19
For PANAMA and NEW YORK, [illegible] freight and passengers to ACAPULCO, SAN JOSE DE GUATEMALA, LA LIBERTAD and PUNTA ARENAS.

Fare to New York,

CABIN .... $130 **STEERAGE** $65

Tickets to and from Europe by any line for sale at lowest rates; also for Havana and all West India ports.

Zealandia .... June 7
At 12 [illegible] M., or on arrival of the English mails, for HONOLULU, AUCKLAND and SYDNEY.
Ten Dollars additional is charged for Upper Cabin Passage.
Round the World Trip Tickets, via New Zealand and Australia, $650.
Tickets also issued from San Francisco to New York via New Zealand and Australia.

Idaho .... May 20
For VICTORIA, PORT TOWNSEND, SEATTLE and TACOMA, connecting at Tacoma with Northern Pacific Railroad for PORTLAND, Oregon, and at Seattle with [illegible] Steamers for SKAGIT RIVER and Mines.
Tickets must be purchased before [illegible] M. on day of sailing.
For freight or passage apply at the office, corner of First and Brannan streets.

WILLIAMS, DIMOND & CO., General Agents.

jy12-tf

For Callao, Valparaiso,

MONTEVIDEO, RIO DE JANEIRO, PERNAMBUCO, LISBON, BORDEAUX, LIVERPOOL, AND ALL INTERMEDIATE PORTS.

THE PACIFIC STEAM NAVIGATION Company's Steamers will leave **Panama on the 2d 10th or 11th, and 25th of each month.**

Through Bills of Lading for cargo and through Passenger Tickets are issued to and from the East and West Coast in connection with the Pacific Mail Steamship Company. For further particulars apply to

WILLIAMS, DIMOND & CO., Agents.

ja19-tf UNION BLOCK, Cor. Market and Pine Streets

CUNARD LINE.

BRITISH AND NORTH AMERICAN Royal Mail Steamships between New York and Liverpool, calling at Queenstown.

ABYSSINIA	March 31	
BOTHNIA	April 7	May 12
PARTHIA	April 14	
GALLIA	April 21	
BOTHNIA	April 28	
ALGERIA		May 5
HECLA		

Sailing from New York Every Wednesday.

Passage can be secured and all information given on application to

WILLIAMS, DIMOND & CO.,

UNION BLOCK, Cor. Market and Pine Streets

Occidental and Oriental Steamship Company,

FOR JAPAN AND CHINA.

Leave Wharf, corner First and Brannan Streets, at noon for

YOKOHAMA AND HONGKONG

Connecting at Yokohama with Steamers for **Shanghae.**

GAELIC.	OCEANIC.	BELGIC.
May 27	June 17	

[illegible] Tickets [illegible] at No. 2 New Montgomery Street.
For freight apply to **Geo. H. Rice**, Freight Agent, at the Pacific Mail Steamship Company's Wharf, or 202 Market Street [illegible].

T. H. GOODMAN,
General Passenger Agent.

LELAND STANFORD, President.

THE CALIFORNIA LINE,

For San Francisco from New York.

THE A1 FIRST-CLASS SHIP

.... Master

[illegible] Pier 12, [illegible] quick dispatch, having large engagements [illegible]

ROBT. B. VAN VLECK,
100 Wall St., New York.

Or to **WILLIAMS, DIMOND & CO.,** San Francisco.

INSURANCE.

BRITISH AND FOREIGN Marine Insurance Company,

Limited.

Capital Subscribed	$5,000,000
Capital Paid up	$1,000,000
Cash Reserve Fund (in addition to capital)	$1,931,741

Pacific Department

LONDON & LANCASHIRE

Fire Insurance Co., of Livepool.

Capital,	$7,500,000
Cash Assets,	1,826 943

MANCHESTER FIRE INSURANCE CO.

OF MANCHESTER.

Capital,	$5,000,000
Cash Assets,	1,288 367

BALFOUR, GUTHRIE & CO.

GENERAL AGENTS.

316 California St., San Francisco

INSURANCE.

UNION MARINE INSURANCE COMPANY LIMITED

Liverpool.

Paid up capital		$1,076,000
Net surplus 31, Dec., '79	515 943	$1 531,943

MARITIME INSURANCE COMPANY LIMITED

Liverpool.

Paid up Capital,		$494,101
Net surplus Dec. 31, '79	853,214.75	$1,347,314.75

FALKNER, BELL & CO., Agents.

THE SWISS MARINE Insurance Companies Combined.

Capital, - $4,000,000.

"HELVETIA" Swiss Fire Insurance Company

OF ST. GALL.

Capital, - - $2,000,000.

HARRY W. SYZ, Agent.

225 SANSOME ST San Francisco

JAMES F. CHAPMAN & CO.,
SHIPPING AND COMMISSION MERCHANTS
No. 22 [illegible] Street, San Francisco, California.
Liberal Advances made on Consignments

Vessels in Port.

WHEAT

ARRIVED	RIG	NAME	TONS	CAPTAIN	CONSIGNEES & AGTS	FOR	RATE	CHARTERERS	WHARF
April 9	Br ship	Centaur	[illegible]	Thomson	[illegible]	Liverpool	[illegible]	G W McNear	[illegible]
March 19	Br ship	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
April 5	Am ship	[illegible] of the Seas	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	G W McNear	[illegible]
April 17	Am ship	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
April 2[illegible]	Br bark	[illegible]	[illegible]	[illegible]	[illegible]	Cork	[illegible]	[illegible]	[illegible]
April 2[illegible]	Br bark	[illegible]	[illegible]	[illegible]	[illegible]	Cork	[illegible]	[illegible]	[illegible]
April 7	Am ship	Young America	1439	Baker	[illegible]	Liverpool	[illegible]	[illegible]	[illegible]

Total 9257 tons. Same time last year 16 364 tons.

DISENGAGED.

ARRIVED	RIG	NAME	TONS	CAPTAIN	FROM	CARGO	CONSIGNEES & AGTS	WHARF
April 4	Br ship	[illegible]	[illegible]	[illegible]	[illegible]	ballast	[illegible]	[illegible]
May 2	Am ship	[illegible]	[illegible]	[illegible]	[illegible]	mdse	[illegible]	[illegible]
March [illegible]	Am bark	[illegible]	[illegible]	[illegible]	[illegible]	mdse	[illegible]	[illegible]
April 2	Am ship	[illegible]	[illegible]	[illegible]	New York	mdse	[illegible]	[illegible]
May 12	Am ship	[illegible]	[illegible]	[illegible]	[illegible]	mdse	[illegible]	[illegible]
April 9	Am ship	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
May 7	Am ship	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Total 9700 tons. Same time last year 24,39[illegible] tons.

MISCELLANEOUS

ARRIVED	RIG	NAME	TONS	CAPTAIN	FOR	CARGO	CONSIGNEES & AGTS	WHARF
May 3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Hathaway's
April 21	[illegible] bark	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
April [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Mission
May 5	Bkt bark	[illegible]	[illegible]	[illegible]	[illegible] and return	coal	[illegible]	Pacific
May 6	Br bark	Lady Lampson	412	[illegible]	Honolulu and return	mdse	Welch & Co	Mission
Feb 25	Am ship	Seminole	[illegible]	Holmes	New York	mdse	Geo Howes & Co	Vallejo
April 18	[illegible]	[illegible]	[illegible]	[illegible]	West Coast	barley	[illegible]	North Point

Total [illegible] tons. Same time last year 8834 tons.

SHIPPING.

"DALE" LINE OF IRON PACKETS.

FROM LIVERPOOL FOR SAN FRANCISCO Direct

Ennerdale	1249 Tons	Borrowdale	1197 Tons
Patterdale	1199 "	Eskdale	1220 "
Mitredale	1230 "	Grisedale	1221 "
		Dunnerdale	1066 "
Thirlmere	1719 Tons	Grasmere	1245 Tons
Rydalmere	1245 "	Buttermere	1020 "

THE **Snowdon**

is now receiving cargo and will sail with usual dispatch. For Freight, etc. apply in Liverpool to

JOHN D. NEWTON & CO.,
9 Exchange Court, Exchange St. East.

BALFOUR, GUTHRIE & CO., Agents,
316 California St.

mch25-tf

The San Francisco Clipper Line.

FROM NEW YORK TO SAN FRANCISCO.

THE FINE NEW CLIPPER SHIP

Glendon,

MALING .... Master

Is now on the berth and will have quick dispatch. For freight apply to

SIMONSON & HOWES,
112 Wall Street, New York.

Or to J. W. KNOWLES, 36 California St., San Francisco.

FOR LIVERPOOL DIRECT.

THE A1 BRITISH SHIP

Centaur,

THOMSON .... Master

Having large engagements will receive quick dispatch for the above port. For balance of freight apply to

G. W. McNEAR,
20 California Street.

ap23-tf

The Planters' Line for Honolulu

THE A1 BARK

Lady Lampson,

MARSTON .... Master

Will receive freight at Mission street wharf on WEDNESDAY, May 12th. For freight or passage apply to

WELCH & CO.,
109 California Street.

MOVEMENT OF OCEAN STEAMERS

TO ARRIVE.

NAME	FROM	
Los Angeles	San Diego	May [illegible]
Idaho	Victoria	May [illegible]
State of California	Portland	May [illegible]
[illegible]	Panama	May [illegible]
[illegible]	Victoria	May [illegible]
[illegible]	San Francisco	May [illegible]
[illegible]	[illegible]	May [illegible]

[illegible]

SHIPPING

SUTTON & CO'S DISPATCH LINE,

— FOR —

San Francisco from New York.

SAILING POSITIVELY AS ADVERTISED the splendid and popular A1 first class ship

SNOW & BURGESS........ ANDERSON, Master
ENOS SOULE .... LAWRENCE, Master

GEO. HOWES & CO., Agents,
302 California Street, San Francisco.

SUTTON & CO.'S DISPATCH LINE

— FOR —

San Francisco from Philadelphia.

SAILING POSITIVELY AS ADVERTISED, the splendid and popular A1 first-class ship

FLORENCE .... KELLY, Master

GEO HOWES & CO., Agents.
302 California St., S. F.

FOR NEW YORK. DISPATCH LINE.

FROM VALLEJO-STREET WHARF.

THE FINE A1 SHIP

Seminole,

HOLMES .... Master

This vessel having large engagements will receive quick dispatch. For balance of freight apply to

GEO. HOWES & CO.,
302 California Street.

Consignees in New York—Messrs. SUTTON & CO.

BOSTON LINE.

THE FINE A1 CLIPPER SHIP

Samuel Skolfield,

SKOLFIELD .... Master

This vessel having large engagements will have quick dispatch. For balance of freight apply to

E. BABSON, Agent,
136 State Street, Boston.

[illegible] WILLIAMS, DIMOND & CO., Consignees in San Francisco.

HAWAIIAN LINE FOR HONOLULU.

THE FINE SCHOONER

American Girl,

BACKUS .... Master

Will have quick dispatch for the above port. For freight or passage apply to

WILLIAMS, DIMOND & CO.
UNION BLOCK, Cor. Market and Pine Streets

FOR HONOLULU

STAR LINE

THE A1 BARK

Kalakaua,

.... Master

[illegible] For freight [illegible]

GEO F. COFFIN & CO.
No. 13 [illegible] Street

INSURANCE.

BY BALZER & CO'S FIRE & MARINE INSURANCE AGENCY.

OFFICE 209 SANSOME ST. [illegible]

NORTH GERMAN

[illegible]

NEW YORK UNDERWRITERS AGENCY.

[illegible]

DANUBE

[illegible]

THE MARINE INSURANCE CO., OF LONDON, ENGLAND

[illegible]

Whole amount of Joint Stock and Guaranteed Capital	$5,000,000
Whole amount of Capital paid up	900,000
Cash Assets December 31 [illegible]	4,181,242

G. W. McNEAR, Agent,
20 California St.

THE UNIVERSAL MARINE INSURANCE COMPANY

LIMITED

LONDON, ENGLAND.

[illegible] capital	$5,000,000
Whole amount of paid up [illegible]	1,250,000
Cash Assets December 31 [illegible]	6,746,850

COMMERCIAL UNION ASSURANCE COMPANY.

[illegible] BRANCH

LONDON, ENGLAND

[illegible]	$12,500,000
[illegible]	$1,250,000
[illegible]	$4,451,[illegible]

[illegible]

EXPORTS OF GRAIN 1879-80.

The following details show the amount of grain and flour shipped from this port from July 1, 1879 to date:

WHEAT

	CENTALS	VALUE
Antwerp	134,778	$677,5[illegible]
British Columbia	84	[illegible]
Bordeaux	103,[illegible]	[illegible]
Central America	13,[illegible]	[illegible] 841
Callao	[illegible]	[illegible]
Cork	6,057,[illegible]	[illegible] 644,[illegible]
[illegible]	16 407	[illegible]
Cape Town	[illegible]	[illegible]
Dublin	79 3[illegible]	[illegible]
Dunkirk	19,961	[illegible]
Falmouth	134 [illegible]	[illegible]
Havre	[illegible]	[illegible]
Honolulu, Etc	1,174	[illegible]
Liverpool	2,170 514	4,1[illegible] 782
Mexico	118	[illegible]
Pacific Islands	58	66
[illegible]	39 2[illegible]	71,7[illegible]
South America	20	[illegible]
Tahiti	121	[illegible]
Total	10,1[illegible]	[illegible]
Same time 1879	[illegible]	[illegible]
" " 1878	3,759 108	[illegible]

BARLEY

British Columbia	[illegible]	$ [illegible]
Cork	[illegible]	[illegible]
Callao	[illegible]	4,124
Cape Town	141	[illegible]
China	[illegible]	[illegible]
Central America	[illegible]	[illegible]
Honolulu, Etc	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
Japan	132	[illegible]
Liverpool	1[illegible],912	[illegible]
Mexico	[illegible]	[illegible]
Melbourne	21,[illegible]	[illegible]
New Zealand	[illegible]	[illegible]
New York	[illegible]	[illegible]
Overland	104,766	[illegible]
Pacific Islands	154	[illegible]
Philadelphia	13,574	10 5[illegible]
Panama	48	47
Sydney	14,493	[illegible]
Tahiti	645	[illegible]
Total	[illegible]	$ [illegible]
Same time 1878	[illegible]	[illegible]
" " 1877	[illegible]	[illegible]

RYE

Cork	10,5[illegible]	$1[illegible]
Central America	10	[illegible]
Falmouth	10,[illegible]	10,[illegible]
Totals	10,[illegible]	[illegible]

FLOUR

	BARRELS	VALUE
Bordeaux	20	$ [illegible]
British Columbia	2,[illegible]	[illegible]
Bremen	[illegible]	[illegible]
China	1[illegible]	[illegible]
Callao	[illegible]	[illegible]
Central America	[illegible]	[illegible]
Honolulu, Etc	[illegible]	[illegible]
Liverpool	101,[illegible]	[illegible]
London	[illegible]	[illegible]
Japan	[illegible]	[illegible]
Manila	[illegible]	[illegible]
Mexico	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
Pacific Islands	[illegible]	[illegible]
South America	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
Tahiti	[illegible]	[illegible]
Total	[illegible]	[illegible]
Same time 1879	[illegible]	[illegible]
" " 1878	[illegible]	[illegible]

Exports of Grain 1879-80 Amount Arrived.

WHEAT

[illegible]

BARLEY

[illegible]

RYE

Falmouth	6 347	$ [illegible]

FLOUR

[illegible]

INSURANCE.

TRANSATLANTIC FIRE INSURANCE COMP'Y,

OF HAMBURG.

CAPITAL, $[illegible],000, U. S. Gold Coin.

[illegible]

GEO. [illegible] & CO.

General Agents [illegible] 304 California St.

CONSIGNEE NOTICES

[illegible]

BALFOUR, GUTHRIE & CO.

MISCELLANEOUS.

FOR SALE.

LIVERPOOL RETURN

SECOND-HAND BAGS.

F. J. KEND[illegible] 302 California St.

CYRUS NOBLE DISTILLERY.

Lynchburg, [illegible] December [illegible]

Messrs. LILIENTHAL & CO.,

San Francisco [illegible].

[illegible]

[illegible]	Noble [illegible]	Distillation of 1875.
[illegible]	Noble Bour[illegible]	Distillation of 1872 73.
[illegible]	Noble [illegible]	Distillation of 1869 70.
[illegible]	Noble [illegible]	Distillation of 1867-68.

JOHN JENNINGS,

[illegible]

CYRUS NOBLE.

For sale in lots to suit from store, warehouse, or ship's side, to clipper arrivals, via Cape Horn.

LILIENTHAL & CO.,
SOLE PROPRIETORS
223 California Street.

READ "The Californian," The New Magazine.

The May number is now out, containing a remarkable collection of brilliant papers—Travels, Stories, Poetry, Political and Social Science, Field Sports, Essays, Sketches, Etc., Etc., Etc.

FOR SALE BY ALL NEWSDEALERS,

AND AT THE OFFICE,

202 Sansome St., San Francisco.

Single Number, Only	25 Cents
Yearly Subscription,	$3 00

TIDE TABLES.

From the Pacific Tide Tables of the United States Coast Survey.

The Height is reckoned from the level of average lower low water. When the [illegible] A. M. column [illegible] P. M. column [illegible]

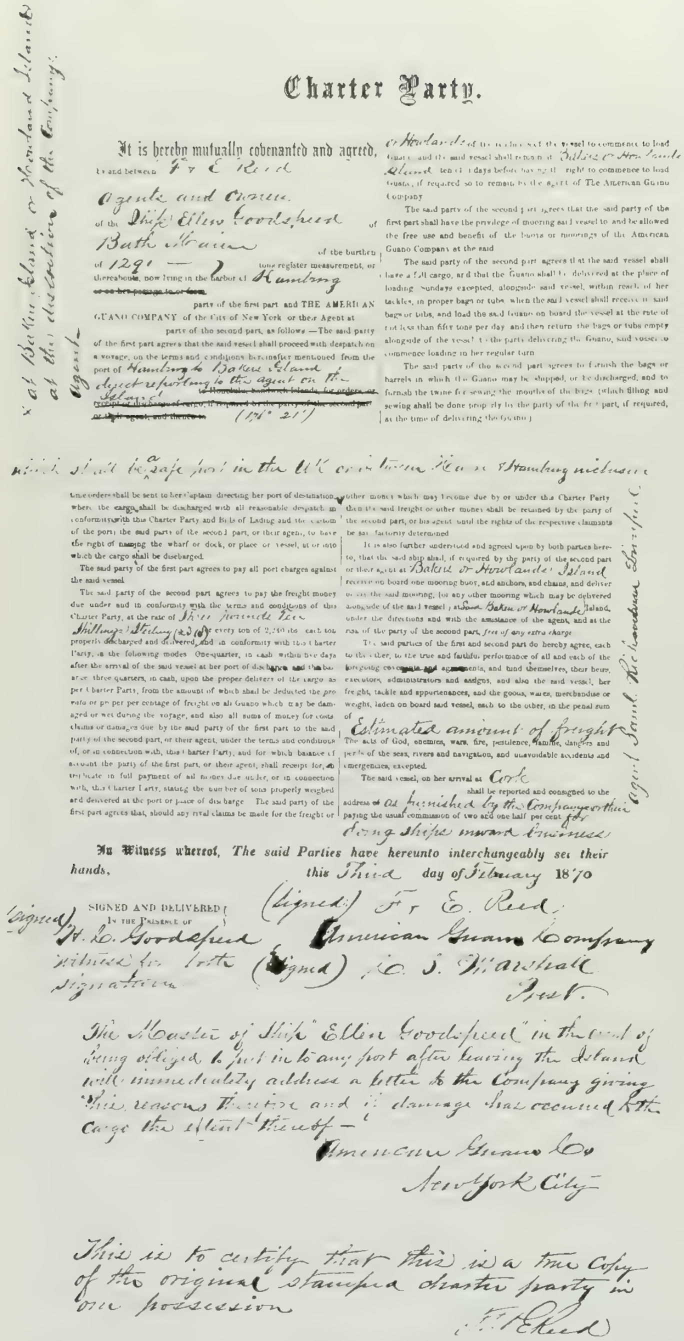
[illegible]

SIGNAL SERVICE REPORT May 13

[illegible]

RAIN FALL.

[illegible]



x at Baker Island or Howland Island at the discretion of the Company; Agent

Charter Party.

It is hereby mutually covenanted and agreed, by and between F. & E. Reed Agents and Owners of the Ship Ellen Goodspeed of Bath Maine of the burthen of 1291 — tons register measurement, or thereabouts, now lying in the harbor of Hamburg ~~or on her passage to or from~~ party of the first part and THE AMERICAN GUANO COMPANY of the City of New York or their Agent at party of the second part, as follows —The said party of the first part agrees that the said vessel shall proceed with despatch on a voyage, on the terms and conditions hereinafter mentioned from the port of Hamburg to Baker Island direct reporting to the agent on the Island ~~to Honolulu, Sandwich Islands, for orders or receipt of discharge of cargo, if required by the party of the second part or their agent, and thence to~~ (176° 21')

or Howland's of the [illegible] the vessel to commence to load Guano and the said vessel shall remain at Baker or Howlands' Island ten (10) days before having the right to commence to load Guano, if required so to remain by the agent of The American Guano Company.

The said party of the second part agrees that the said party of the first part shall have the privilege of mooring said vessel to and be allowed the free use and benefit of the buoys or moorings of the American Guano Company at the said

The said party of the second part agrees that the said vessel shall have a full cargo, and that the Guano shall be delivered at the place of loading, Sundays excepted, alongside said vessel, within reach of her tackles, in proper bags or tubs, when the said vessel shall receive the said bags or tubs, and load the said Guano on board the vessel at the rate of not less than fifty tons per day, and then return the bags or tubs empty alongside of the vessel to the party delivering the Guano, said vessel to commence loading in her regular turn.

The said party of the second part agrees to furnish the bags or barrels in which the Guano may be shipped, or be discharged, and to furnish the twine for sewing the mouths of the bags (which filling and sewing shall be done properly by the party of the first part, if required, at the time of delivering the Guano.)

which shall be a safe port in the U.K. or between Havre & Hamburg inclusive

time orders shall be sent to her Captain directing her port of destination, where the cargo shall be discharged with all reasonable despatch in conformity with this Charter Party and Bills of Lading and the custom of the port; the said party of the second part, or their agent, to have the right of naming the wharf or dock, or place or vessel, at or into which the cargo shall be discharged.

The said party of the first part agrees to pay all port charges against the said vessel.

The said party of the second part agrees to pay the freight money due under and in conformity with the terms and conditions of this Charter Party, at the rate of Three pounds Ten Shillings Sterling (£3 10) for every ton of 2,240 lbs. each ton properly discharged and delivered, and in conformity with this Charter Party, in the following modes: One-quarter, in cash within five days after the arrival of the said vessel at her port of discharge, and the balance three quarters, in cash, upon the proper delivery of the cargo as per Charter Party, from the amount of which shall be deducted the *pro rata* or proper per centage of freight on all Guano which may be damaged or wet during the voyage, and also all sums of money for costs claims or damages due by the said party of the first part to the said party of the second part, or their agent, under the terms and conditions of, or in connection with, this Charter Party, and for which balance of account the party of the first part, or their agent, shall receipt for, in triplicate in full payment of all money due under, or in connection with, this Charter Party, stating the number of tons properly weighed and delivered at the port or place of discharge. The said party of the first part agrees that, should any rival claims be made for the freight or other money which may become due by or under this Charter Party then the said freight or other money shall be retained by the party of the second part, or his agent, until the rights of the respective claimants be satisfactorily determined.

It is also further understood and agreed upon by both parties hereto, that the said ship shall, if required by the party of the second part or their agent at Baker or Howlands' Island receive on board one mooring buoy, and anchors, and chains, and deliver [illegible] the said mooring, (or any other mooring which may be delivered alongside of the said vessel), at ~~Same~~ Baker or Howlands' Island, under the directions and with the assistance of the agent, and at the risk of the party of the second part, *free of any extra charge.*

The said parties of the first and second part do hereby agree, each to the other, to the true and faithful performance of all and each of the foregoing covenants and agreements, and bind themselves, their heirs, executors, administrators and assigns, and also the said vessel, her freight, tackle and appurtenances, and the goods, wares, merchandise or weight, laden on board said vessel, each to the other, in the penal sum of Estimated amount of freight

The acts of God, enemies, wars, fire, pestilence, famine, dangers and perils of the seas, rivers and navigation, and unavoidable accidents and emergencies, excepted.

The said vessel, on her arrival at Cork shall be reported and consigned to the address ~~of~~ as furnished by the Company or their paying the usual commission of two and one half per cent for doing ships inward business

Agent Saml. Richardson Liverpool

In Witness whereof, *The said Parties have hereunto interchangeably set their hands,* this Third day of February 1870

SIGNED AND DELIVERED IN THE PRESENCE OF

(Signed) F. & E. Reed

(Signed) H. L. Goodspeed
witness for both signatures

American Guano Company
(Signed) C. S. Marshall
Prest.

The Master of Ship "Ellen Goodspeed" in the event of being obliged to put in to any port after leaving the Island will immediately address a letter to the Company giving his reasons therefor and if damage has occurred to the cargo the extent thereof—

American Guano Co
New York City

This is to certify that this is a true Copy of the original stamped charter party in our possession

F. & E. Reed

The beginning and end of a charter party document as used in San Francisco in 1870.

Courtesy of C. Beyfuss.

derwriters were prevalent even in the earlier days. The Coast Review for January 18, 1877, contains a description of the annual banquet of the Board, held in the Palace Hotel. It is recorded that numerous wines "of approved brands" were served, there was music by Bellenberg's Band, and the assemblage was entertained by songs from several members of the marine profession. Not such a bad description of the dinners of today, if we leave out . . . . . Ballenberg's Band.

At this meeting, C. T. Hopkins, president of the California Insurance Company and secretary of the Board, was much perturbed over the sad state of things following the Gold Rush.

"When I look back," he said, "and consider the difficulties that beset the underwriting interests in the early days, I wonder that the business ever obtained a respectable foothold on this Coast. . . . . . . I recollect the brig Caleb Curtis in 1850, a new brig of 200 tons. She came here insured for $24,000, and all that was offered for her purchase in San Francisco was $4000."

He then went on to recount the trials and tribulations of one insurer who had been so gullible as to pay three successive losses on successive shipments in which the same damaged goods had been used as evidence.

The marine business of San Francisco mounted steadily. The total coverage written in the year 1872 was $54,200,665, which increased in 1876 to $72,803,855. The companies whose policies made up the total for the latter year were as follows:

Company	Home Office	Amount Written
British and Foreign	Liverpool	$14,851,305
California	San Francisco	2,484,416
Commercial	San Francisco	1,757,147
Chinese Insurance Co.	Hongkong	778,830
China Traders	Hongkong	1,656,574
Fireman's Fund	San Francisco	4,253,213
Maritime	Liverpool	4,151,968
New Orleans	New Orleans	569,009
North China	Shanghai	661,112
New Zealand	Auckland	1,904,279
State Investment	San Francisco	1,644,664
Swiss Lloyds'	Switzerland	14,397,879
Sea	Liverpool	1,817,895
Switzerland	Zurich	2,085,752
Transatlantic	Berlin	5,093,532
Thames and Mersey	Liverpool	1,057,455
Union	San Francisco	8,261,640
Union	Liverpool	4,151,968
Union	Galveston	18,859
Yang Tsze	Shanghai	1,214,358
		$72,803,855

In the year 1890, local companies wrote a business of $19,703,243, distributed among five offices in the following ratio:

California	$3,505,861
Commercial	827,233
Fireman's Fund	8,129,008
Sun	2,671,919
Union	4,569,222
	$19,703,243

During the same period, eastern and foreign companies did a gross business of $114,725,841, of which only $3,288,126 went to American companies. These companies were three in number, the Boston (Capt. J. N. Knowles' company), $1,756,108; the Insurance Company of North America, $1,348,625; and the St. Paul, $183,393.

By the following year the local marine companies were reduced to three, the California, Fireman's Fund, and the Sun. Of the four offices outside San Francisco which are mentioned by contemporary publications as carrying the largest share of the marine business, all were Swiss, English, or German.

We come thus to the inevitable conclusion that New York and other eastern financial centers had very little influence on the growth of Pacific Coast marine insurance. Like Topsy, it just grew—albeit we doubt if Topsy ever had a solicitous uncle like John Bull.

Our present marine fraternity owes its very existence to the efforts of those sturdy pioneers who laid the foundation of an insurance center along California Street in the days of '49. They had many evils to contend with—it wasn't long before they found that there were adjusters in their midst.

One of the earliest of these was Thomas N. Cazneau, who styles himself a "despacheur" in true French fashion. His penmanship, as well as his adjusting technique, is attested by surviving specimens of his elaborately scrolled handiwork. What with colored title pages and shaded titles an inch or so high, we can easily see how they came to call it "drawing up" an adjustment.

And then, too, there was that sturdy dean of San Francisco adjusters, Cornelius V. S. Gibbs, who was born in Rhode Island in 1824, his father being Governor of that state, and trekked across the plains to California in 1849. And there were E. A. Kellogg and Gomer Evans, adjusters, and a long list of pioneer underwriters including such names as C. T. Hopkins, Gustave Touchard, Geo. S. Mann, and D. J. Staples.

No comment on the development of Pacific Coast underwriting is complete without some mention of the growth of the Fireman's Fund Insurance Company. The company was launched in 1862 by William Holdredge, and its $200,000 capital placed in the hands of a board of fifty directors, including Samuel Brannan, J. C. Flood (the bonanza king), and James Phelan, father of Senator Phelan.

The name of the new company was due to a somewhat unique and not altogether practicable idea of its founders. The volunteer fire departments of those days were not rolling in wealth, and each of them maintained a charity fund, which was always on the lookout for contributions from various sources. William Holdredge and his noble fifty proposed to donate a share of their net earnings in each city of the state to the local charity fund. Each assured would then receive a large tin plate, bearing the words "Insured in the Fireman's Fund." The theory appears to have been that the fire laddies, seeing a row of dwellings merrily ablaze, would gallop to the rescue of the one bearing the tin plate, thus assuring a fat contribution to their local fund. Either the firemen or the house holders were hard to convince, however, and the plan soon fell through, leaving only the name.

Among the early presidents of the company were Holdredge, Samuel H. Parker, and David J. Staples, the latter a locomotive builder of Massachusetts who crossed the plains in 1849 to become a rancher in Sacramento Valley.

It was under President Staples that the marine department of the company was opened in 1867. In 1868 it was decided to undertake a general fire and marine business throughout the United States.

After weathering severe reverses in the the Chicago and Boston fires, the Fireman's Fund continued to forge ahead, and between 1890 and 1895 it became apparent that the other local companies were being gradually forced out of the picture. During these years the company absorbed, either by reinsurance or purchase, The Home Mutual, the Anglo-Nevada Assurance, the California, the Oakland Home, the Northwest Insurance Company of Portland, and the Sun Insurance Company of San Francisco.

J. B. Levison, President of the Fireman's Fund at the present time, is a native of Nevada and began his underwriting career in 1878, becoming marine manager for the San Francisco firm of Hutchinson and Mann in 1880. Mr. Levison later became marine secretary of the Anglo-Nevada, and entered the Fireman's Fund when the Anglo-Nevada was absorbed in 1890.

The advance of the West in the marine world has been steady and unmistakable, and its challenge to the East has been carried by representative men from all the maritime professions.

In New York, there are no better-known admiralty attorneys than Ira Campbell and the Single Brothers. The roster of the Shipping Board bears witness to the number of Pacific Coast men who have rendered yeoman service to the country. In Norman F. Titus, recently of the McCormick Steamship Lines, we find another example of one of the brethren who bears the light abroad. Mr. Titus was recently called to Washington as Director of Shipping under Secretary Hoover, who, by the way, is also a Californian.

In the field of marine underwriting, we find the names of Charles R. Page, chief of the Fireman's Fund forces in New York. Bracketed with Mr. Page in eastern circles is C. A. Hulme, marine secretary of the Home of New York, a nationally known underwriter who received his experience in San Francisco.

Our men and our institutions are worthy of pride. A delving into history—even so shallow an excursion as this—is valueless unless it can be made to serve as an inspiration for the future. Our past is built by men—the right kind of men—and upon certain natural conditions. We developed the wheat trade, which served its purpose and passed on. We furnished the last haven of the sailing ship, which plied the broad bosom of the Pacific long after steam had driven canvas from other seas. Our lumber trade and bar harbors developed the squat-waisted steam schooner, which continues to out-sail and out-earn any competing type of vessel in its peculiar trade. There have been heard, at times, certain doleful cries emanating from self-appointed mourners who bewail the passing of the steam schooner, but their grief is premature. The unlovely, round-tailed craft with the detachable wooden bottom will be sitting comfortably on river bottoms, and scraping over sand bars, long after her sisters of steel have broken up on a lee shore.

These things, all of them, have made the Pacific Coast an independent center of the marine world. We have a unity, a clear-visioned creed of action that is the heritage of our traditions. A good, hard-fought past is behind us, and in the Asiatic and transpacific trade, there is every indication that an era of opportunity is ahead of us.

Let us, in the spirit of the New Year, "Hereby agree, and pledge our honor as gentlemen," as did our forerunners in '69, that the Pacific Slope will continue and improve upon its present high name for honesty and the best policy.

The Sewall "Big Four"

The Last Effort to Revive the Building of Large Wooden Sailing Ships in New England

By F. C. Matthews

The launching of the Shenandoah in 1890 at Arthur Sewall's shipyard, Bath, Maine.

BETWEEN January 1890 and September 1892 four immense wooden sailing ships were launched from the yards of Arthur Sewall & Co. of Bath, Maine, who built them for their own account. No full rigged ship had been built at Bath for several years previously and the advent of the first of the quartette was hailed as a forerunner of a fleet which was to restore American commerce to its former prestige and become as famous as were the old time clippers in the heyday of their career. The sequel proved, however, that conditions had so vitally changed during the forty years intervening, that the days of the wooden square rigger had vanished forever, and following the launch of the Roanoke, the Messrs. Sewall turned their attention to the construction of steel ships, and in 1894 launched the Dirigo.

The Sewall "Big Four" were Rappahannock, Shenandoah, Susquehanna, and Roanoke, built in the order named. All were four-masted barks except the Rappahannock, she being a three-master. They were designed by William F. Pattee of Bath and in model closely resembled each other. The Susquehanna was the smallest, registering 2744 tons, and the Roanoke the largest, 3362 tons. The latter was the largest wooden sailing ship ever built for the carrying trade, her actual deadweight capacity being about 5500 tons.

It is true that two giant sailing ships had been built near Quebec in 1824-1825, the Columbus and the Baron of Renfrew, one being a four-master, but they were designed to freight a cargo of square timbers to Great Britain and were constructed in such a manner that they could be taken apart after arrival and the material in them sold, the idea apparently being evasion of the British timber tax. The Columbus was 301 feet long; tonnage 3690. The Renfrew was 309 by 60 by 38 feet; tonnage 5294. Columbus arrived safely at London but was not taken apart, being sent back to St. John for another cargo. She foundered on the passage. The Renfrew was lost on the Goodwin Sands on her first outward passage.

The famous clipper ship Great Republic, the first four-master built in the United States was, when launched, 335 by 53 by 38 feet; registered tonnage 4555. However, she was practically destroyed by fire when loaded and ready to leave New York on her first voyage, and after being reconstructed, her tonnage was reduced to 3356, British measurement. On her first passage to San Francisco she had 5000 tons of weight and measurement cargo laden at New York, and in 1860 took from San Francisco to England a full cargo of wheat and flour, 3600 tons.

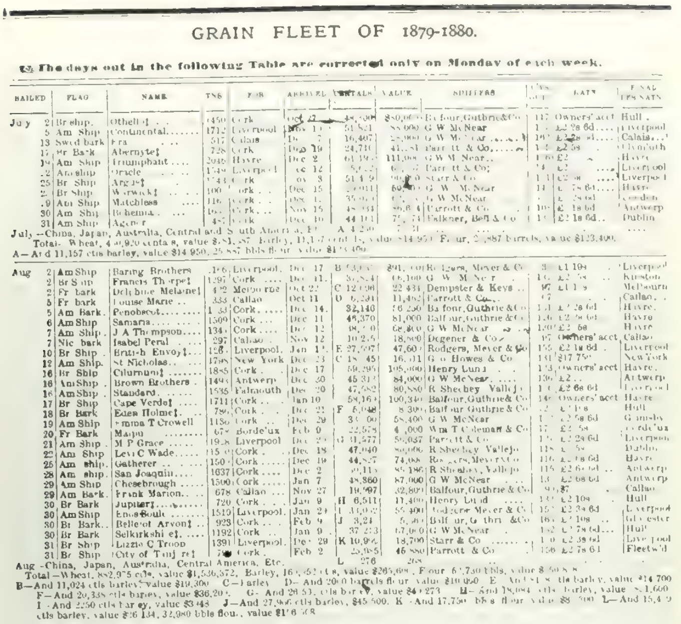
In 1892 the Susquehanna loaded at San Francisco 3950 tons of wheat for Liverpool.

Describing the Shenandoah after her arrival in England in December 1892, Fairplay, a leading shipping magazine, had the following:

"What is, in all probability, the last of the beautiful American sailing ships built of wood is now at Liverpool. The Shenandoah is a four-masted wooden barque, built by Messrs. A. Sewall & Co., of Bath, Maine, and owned by them. She is commanded by Captain Murphy, a splendid specimen of the best class of Yankee skippers. The Shenandoah is a curious combination of new and old ideas. In her structure she is a fine example of the wood shipbuilder's art and is modeled on the well known Yankee lines. She has the old-fashioned square stern, built lower masts, wooden anchor stocks, wooden tiller, and rope steering tackles, with the modern sidelight towers, steam windlass, steam winch, and rigging screws. She carries an enormous spread of sail. Her lower yards are 94 feet and her three skysail yards 43 feet long. These wooden ships are, however, very costly and are being replaced by steel."

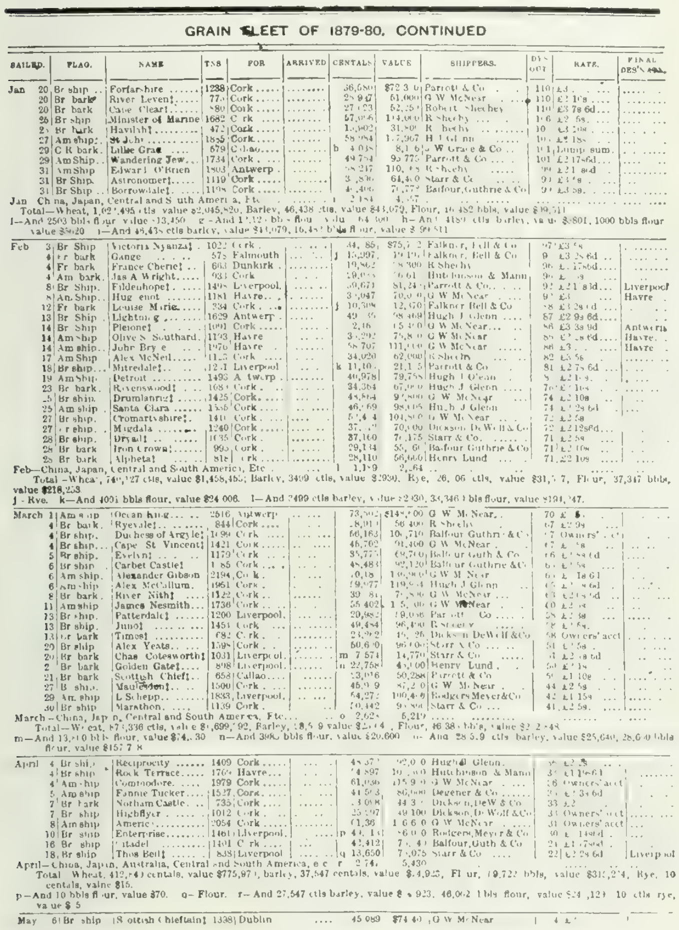
As to sail area, the spread of canvas on the Sewall ships was about 11,000 yards. The Great Republic, as originally sparred, swung a mainyard of 120 feet and could spread 15,553 yards of canvas. The Challenge, of 1347 tons British measurement, built by William H. Webb, New York, in 1851, swung a 90-foot mainyard and spread 12,780 yards of canvas. She carried single topsails and had 56 foremast hands, besides 8 boys. The clipper ship Sovereign of the Seas, Boston, 1852, a single topsail ship, had before the mast, 80 men and 10 boys. The complement of the Shenandoah was 24 A.B's. and 4 apprentices.

In connection with these comparisons, however, it must be remembered that the old clippers carried studding sails as high as the royals and, in addition, all sorts of "flying kites," necessitating very large crews. British tonnage quotations have been used as more



GRAIN FLEET OF 1879-1880.

The days out in the following Table are corrected only on Monday of each week.



GRAIN FLEET OF 1879-80. CONTINUED

THE GRAIN FLEET.

For nearly thirty years American and European sailing ships did a thriving business carrying Pacific Coast grain to the markets of the old world. We show above a few of the sailings of the grain fleet in the fall and winter of 1879-1880, and at the right, the ship M. P. Grace at dock, San Francisco, February 22, 1898. This grain trade was one of the factors forming the foundation upon which so shrewd a ship operator and builder as Arthur Sewall builded his hopes for the success of a large fleet of wooden sailing ships.

closely approximating American new style computation than American figures in effect prior to 1865, which latter, as to clippers especially, were much too large and very misleading.

The Rappahannock

The first of the Big Four to leave the ways in the Sewall yards was the Rappahannock, which was launched January 6, 1890. She was not the first ship of that name nor was the name chosen haphazard, for in the year 1841 William D. Sewall, grandfather of Arthur Sewall, had built in the same yard a ship for the cotton trade which he called Rappahannock. William Henry Harrison, who was then president of the United States, visited Bath while the first Rappahannock was on the stocks and was impressed by her mighty proportions, her tonnage being 1133 which was considerably in excess of that of any merchant vessel theretofore built in the United States. Many presidents succeeded William Henry, until fate brought his grandson, Benjamin Harrison, to the presidential chair, while in the meantime shipbuilder Sewall's grandson had come to preside over the destinies of the Bath shipyard. It came to pass that the new President Harrison visited Maine and during his tour inspected the new Rappahannock. Shortly before the ship was launched he sent to Mr. Sewall his large portrait with the autographic inscription "May every voyage of the ship Rappahannock be prosperous." This portrait, as also a companion one of William D. Sewall, was hung in the cabin of the ship, the heavy oak frames matching to perfection the panel work.

The dimensions of the new Rappahannock were: 287:2 by 48:9 by 28:8; tonnage, 3185, gross; 3053, net. To sheath her to the water line, 4752 sheets were required. Her lower masts were 38 inches in diameter. She cost, ready for sea, about $125,000. The command was given to Captain Wylie R. Dickinson, formerly master of the ship Yorktown.

In spite of the well wishes of President Harrison, the career of the Rappahannock was short and replete with mishaps. Her maiden voyage was from Philadelphia to Japan with 120,000 cases of kerosine and occupied nearly six months. On first proceeding down the Delaware, she grounded on the mud flats below Newcastle but was able to proceed to sea the next day, March 29, 1890. On June 17, a seaman was killed by a fall from aloft during a heavy gale. Off the coast of Japan, September 19, a typhoon was experienced and the ship was hove to for several days; decks were constantly swept by heavy seas and a seaman was washed overboard and lost.

On November 13 she left Kobe with 4400 tons of coal for San Francisco and had the long passage of 44 days across the Pacific. She was in two very heavy gales and lost a seaman overboard. At San Francisco the Rappahannock loaded a cargo of wheat and sailed February 6, 1891, for Liverpool. She arrived out June 16, a passage of 130 days. In the channel she was run down by a steamer and her head gear was damaged.

The Rappahannock sailed from Liverpool July 28, 1891 with about 4000 tons of coal for San Francisco. In the South Pacific her cargo was discovered to be on fire due to spontaneous combustion and Captain Dickinson steered a course for Juan Fernandez. Here, at anchor in Cumberland Bay, she burned to the water's edge during the night of November 11 and was a total loss. The flames had broken out and spread with such rapidity that the captain, his wife, and the crew were obliged to take to the boats. They were picked up by a Chilian dispatch boat and taken to Valparaiso.

America Needs Naval Reserve

SHORTLY after the armistice was signed in 1918 the Naval Auxiliary Reserve of the United States contained 9646 officers and 16,611 enlisted men, but since that time this very necessary arm of our defense has dwindled to seventy-some officers and one enlisted man, a condition in sharp contrast to the situation obtaining in the Naval Reserves of other signatories to the Disarmament Treaty of 1921.

Having in mind the experience which this country went through upon its entrance into the World War, when it was found necessary to call upon foreign bottoms and alien personnel to transport men and supplies to areas of conflict, Congress in 1925, at the instance of the Navy Department and others interested, passed a Naval Reserve Act admirably designed to rehabilitate that service by means of a Merchant Marine Naval Reserve to consist of those American citizens who follow the sea as a profession and who apply for enrollment therein. Such men may be given naval training upon their own application and are to receive one month's base Navy pay per annum in their respective rating in addition to regular pay and allowances when receiving naval training.

The Navy Department has prepared very elaborate regulations to build up this service, and at the last session of Congress an appropriation was requested to enable a demonstration of the practicability of the Navy's plan and the benefits that would accrue from having such a Merchant Marine Naval Reserve. But this request did not receive favorable consideration. The program involved an estimated annual expenditure of only $25,000 and the enrollment of 120 men. This was only to commence the creation of this very valuable reserve force.

It is significant to note that for the fiscal year 1926 there were enrolled in the British Mercantile Naval Reserve (known as the Royal Naval Reserve) over 10,000 officers and men, and an appropriation for that year of $700,000 was actually made by the British government. If England, with her 400 years of commercial and military warfare, considers it advisable in her relatively impoverished condition to expend such a large sum of money for its Merchant Marine Naval Reserve, certainly the United States should appropriate a substantial sum to permit the carrying into effect of the plan already enacted into law by Congress to provide a Merchant Marine Naval Reserve for the United States.

In the event of war the Merchant Naval Reserve would be invaluable in furnishing properly trained men who, during peace times, have prepared themselves with but comparatively little absence from productive industry. In addition to the advisability of such a reserve force from a standpoint of national defense, it is undoubtedly desirable as an aid to merchant shipping. The success of the British reserve has been due, in a large measure at least, to the support it has received from shipowners, and in almost every plan that has ever been submitted in the United States for the promotion of a merchant marine the naval reserve feature in some form has been included.

The discipline undergone in naval training produces order, cleanliness, and respect for authority and undoubtedly would raise the morale of merchant marine personnel. Increased and intensified technical training in engineering and navigation in the Merchant Marine Naval Reserve unquestionably will result in increased efficiency in the merchant service, lessen repair bills, improve operation and navigation, and familiarize both merchant and naval officers and men with the operating methods of each other, and, in time of war, insure closer cooperation.

Furthermore, it is thought that an opportunity to be a naval reservist and to rise in those ranks, while at the same time serving in the merchant service with chances also of advancement if proper efforts are made, will go a long way towards encouraging American youths to return to seagoing professions from which they have been conspicuously absent during late years.

Therefore, as a measure of proper national defense and as an aid to merchant shipping, either independently or in connection with the shipping program and policy now under consideration by the Shipping Board, strenuous demands should be made upon Congress to appropriate a sufficient amount of money to effectuate the Merchant Marine Naval Reserve that is already provided for in the Act of 1925.

(Bulletin No. 9—National Merchant Marine Association.)

America's Exports For 1925

Figures for 1925 Show International Trading at Par for the First Time Since the World War

COMPLETE figures for 1925 for the nations who do more than 90 per cent of the world's export trade show that now, for the first time since the war, international exports are at par again. These 70 nations had an export trade in 1913 valued at $19,426,000,000. Last year the corresponding figure stood at $19,950,000,000, after reducing the $29,970,000,000 worth of trade actually reported to the 1913 buying power of the dollar. Since 1913 it has thus taken twelve years to bring a 2½ per cent actual increase in the value of exports circulating in the world.

What world trade would have been had there been no war may be judged by the rate of advance in export trade that had steadily progressed from 1900 to 1913. The annual growth was six and one-half per cent. Had this growth continued the world would have been doing $41,500,000,000 of export trade at 1913 values instead of $19,950,000,000, the actual figures. At 1925 dollar values it would have done $62,100,000,000 instead of less than $30,000,000,000, the actual figures.

Foreign trade has thus not filled the gap by half between the normal extent to which it would have satisfied the growing demand of human wants, had there been no war, and the extent to which it actually has met them. The accumulated shortages of these twelve years amount to the staggering total of $210,000,000,000 at 1925 gold values, ten times our national debt, or $140,000,000,000 at 1913 values.

World trade has now accelerated its pace to fill this gap. Instead of a 6½ per cent increase, world exports have been gaining more than ten per cent annually for the past three years. But the world will have to increase its exports at this rate yearly for more than thirty years to make up for the ground lost during the war. Even the United States, which gained almost 32 per cent in real exports since 1913 and has made the greatest gain of all nations in volume of trade acquired, is still more than $2,000,000,000 behind the export trade it would have had if the pre-war gain had been uninterrupted.

The moral of these facts is that American foreign traders still have an immense service to the world ahead of them in helping to make up the shortage of necessary goods which the artificial war-deflation of world needs has caused. We are still at least ten years short of catching up with our own normal foreign trading toward that end and the rest of the world is a full generation in arrears.

The table showing how 70 nations of the world distributed these gains and losses reveals a striking shake-up in 1913 alignments of trade power. Europe now holds but 49 per cent of the world's export trade beside the 62 per cent she did then. Her shortage is more than 18 per cent from her 1913 actual exports. This loss is weighted by a 37½ per cent deficit among the 14 nations of eastern Europe, but is gravely affected by the 14 per cent deficit still shown among the 13 much more important trading nations of western Europe.

As Europe has shrunk

	1913	1925	Reduced to 1913 Values	Increase or Decrease	Percentage of Increase or Decrease
North America:					
United States	[illegible]	4,910	3,273	+ 789	+ 31¾%
Canada	461	1,283	855	+ 394	+ 85%
Newfoundland	15	24	16	+ 1	+ 6 2/3%
	2,960	6,217	4,144	+ 1,184	+ 40
Northern Latin America:					
British Honduras	3	5.7	3.3	+ .8	+ 26%
Costa Rica	10	16.5*	11.	+ 1	- 7%
Cuba	165	348	232	+ 67	+ 41
Dominican Republic	11	27	18	+ 7	+ 69
Guatemala	14	30	20	+ 6	+ 38
Haiti	11	19	12	+ 1	+ 9
Honduras	3	12	8	+ 5	+155
Mexico	130	340	226	+ 96	+ 73
Nicaragua	7.7	13*	9.6	+ 1.9	+ 15
Panama	5	8	5.3	+ .3	+ 6
Salvador	9.4	24	16	+ 6.6	+ 70
	369.1	843.2	561.7	+ 192.6	+ 52
Southern Latin America:					
Argentina	501	793	528	+ 27	+ 5 1/3
Brazil	318	490	326	+ 8	+ 2½
Chile	143	221	147	+ 4	+ 2 7/8
Colombia	33	83	55	+ 22	+ 66
Ecuador	16	25	16	---	---
Peru	44	88	58	+ 14	+ 31
Uruguay	71	97	64	- 7	- 10
Venezuela	29	37	24.6	- 4.4	- 15
	1,155	1,834	1,218.6	+ 63.6	+ 5½
Eastern Europe:					
Austria	812	266	177	- 635	- 78%
Bulgaria	36	41	27	- 9	- 25
Czechoslovakia		558	372	---	--
Esthonia		26	17	---	--
Finland	78	140	93	+ 15	+ 19
Greece	23	65**	43	+ 20	+ 86
Hungary	386	142	94	- 292	- 75
Latvia		35	23	---	--
Lithuania		25	16	---	--
Poland		248	165	---	--
Rumania	129	130**	86	- 43	- 33
#Russia in Europe	731	261	174	- 557	- 76
Turkey	94	84*	56	- 38	- 40
Yugoslavia	23	152	101	+ 78	+339
	2,312	2,173	1,444	- 868	- 37½
Western Europe:					
Belgian Customs Union	701	689	453	- 248	- 35
Denmark	193	415	276	+ 83	+ 43
France	1,328	2,165	1,443	+ 115	+ 8 2/3
Germany	2,405	2,094	1,396	-1,009	- 42
Irish Free State		214	142	---	--
Italy	485	727	484	- 1	- 1/5 of 1%
Netherlands	822	726	484	- 338	- 41
Norway	105	187	124	+ 19	+ 18
Portugal	38	31*	20.6	- 17.4	- 46
Spain	190	227	151	- 39	- 20
Sweden	219	365	243	+ 24	+ 10
Switzerland	265	392	261	- 4	- 1½
United Kingdom	3,089	4,479	2,986	- 103	- 3 1/3
	9,840	12,711	8,463.6	- 1,376.4	- 14
Asia:					
Aden	18	22	14	- 4	- 22%
British India	797	1,476	984	+ 187	+ 24
British Malaya	200	719	478	+ 278	+ 140
Ceylon	76	190	126	+ 50	+ 65
China	306	625*	416	+ 110	+ 36
Chosen	15	10	6.6	- 8.4	- 56
French Indo China	55	117	78	+ 23	+ 41
Japan	315	946	630	+ 315	+ 100
Persia	34	96	64	+ 30	+ 88
Philippines	48	149	99	+ 51	+ 106
Siam	30	69	46	+ 16	+ 53
Taiwan	6	20	13	+ 7	+ 116
	1,900	4,439	2,954.6	+ 1,054.6	+ 52½
Australasia:					
Australia	361	752	500	+ 139	+ 38
New Zealand	104	264	176	+ 72	+ 69
	465	1,016	676	+ 211	+ 45½
Africa:					
Algeria	97	115	76	- 21	- 21
Egypt	159	209	199	+ 40	+ 25
Kenya and Uganda	9	38	25	+ 16	+ 177
Morocco, French	8	40	26	+ 18	+ 225
Sudan	6	20	13	+ 7	+ 116
Union of South Africa	141	219	146	+ 5	+ 3½
Zanzibar	5	11	7	+ 2	+ 4
	425	742	492	+ 67	+ 16
Grand Totals	19,426.1	29,975.2	19,954.5	+ 528.4	+ 2 [illegible]
Less United States	16,942.1	25,065.2	16,681.5	- 260.6	- 1½%

* 1924

** Estimated

# Allowing for reduction in territory Russia's loss of export trade since 1913 is about [illegible] percent.

Reduction to 1913 values is based on world quotient estimated by Economic Section of the League of Nations at 1.[illegible].

Table showing international exports for 90 per cent of the world's export trade, as compiled for the year 1925 by the National Foreign Trade Council.

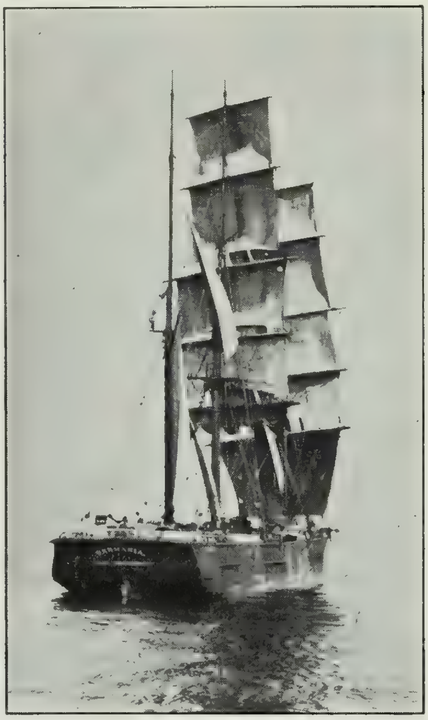
American ship America, outbound from the Golden Gate, October 16, 1898.

as an export continent, English speaking North America has risen by 40 per cent, Latin North America and the West Indies by 52 per cent, and South America by 5 per cent. Asia's increase is greatest of all, 52½ per cent, Australasia has expanded its exports by 45½ per cent and Africa by 16 per cent.

The largest total gain of any country was made by the United States with $789,000,000, or a total of export trade 31¾ per cent greater than that of 1913. Other countries in the world which have made remarkable gains are Yugoslavia, with an increase of $78,000,000 or 339 per cent, British Malaya with an increase of $278,000,000 or 140 per cent, the Philippines with $51,000,000 increase or 106 per cent, Japan with $315,000,000 or almost exactly 100 per cent, Canada with $394,000,000 or 85 per cent, Australasia and New Zealand with $211,000,000 or 45½ per cent, India with $187,000,000 or 24 per cent. Other countries which have more than doubled the value of their real export trade since 1913 include French Morocco, Honduras, the Sudan, Formosa (Taiwan) Australia and the British Crown Colonies and Protectorates of Kenya and Uganda.

Outstanding among the countries whose losses have been severe is Russia, whose export trade is $557,000,000 behind that of 1913 or a 76 per cent loss. Weighting the values of Russian trade with the loss of some of its most valuable industrial territory, Russia's actual loss is still shown to be about 50 per cent. Although Germany is rapidly recovering its export trade, its 1925 figures show the next most important loss, one of 42 per cent from 1913 exports, with a consequent deficit of $1,009,000,000. Other heavy losses are those of Belgium with 35 per cent, the Netherlands with 41 per cent, Spain with 20 per cent, Portugal with 46 per cent, Turkey with 40 per cent, Russia with 33 per cent and Bulgaria with 25 per cent.

It is also evident that the economic map of Europe has been considerably altered by the appearance of new and vigorous industrial nations, notably Poland, Yugoslavia and Czechoslovakia. Poland's export trade is now almost as great as that of the whole of Russia, Czechoslovakia's is twice as large as that of modern Austria, and Yugoslavia's overshadows that of Hungary. The four Baltic countries of Finland, Esthonia, Lithuania and Latvia did a combined export trade during 1925 of $149,000,000, greater than the trade of any country in South America outside of Argentine and Brazil.



The bark Germania of San Francisco. When scrapped in 1900, this vessel had seen fifty years of service without an accident.

The following table of the fall and rise of world exports among the 70 most important trading nations is based on official 1925 figures. Exports are taken because they represent the vitality of foreign trade and because to add import figures would only duplicate the same transaction. These figures cover close to $30,000,000,000 of the estimated total of $33,000,000,000 in export trade that was done throughout the world in the calendar year 1925.

Trade Literature

The **Brown Instrument Co.**, Philadelphia, has for distribution its new catalog No. 15, a handsome 80-page edition containing numerous illustrations, many in five colors, showing the recorders, charts, etc., in full colors. This booklet contains pertinent information on the latest developments in pyrometry, including such high spots as Brown new design recorders, Bureau of Standards certificate of test of Brown pyrometers, new moisture-proof rotary switch, and new champion sillimanite thermocouple protecting tubes. Copies may be had upon request.

The second edition of the Tool Steel Hand Book of **The Ludlum Steel Co.**, Watervliet, N. Y., is off the press. It describes in detail carbon, alloy, rust and heat resisting steels, their use, and methods of treating. It is a very complete work and worthy of a place in the library of every one using steels.

The ship British Isles at San Francisco lightship, outward bound, August 14, 1898.

Photos on this page by courtesy of Captain G. H. Harvey

Auxiliaries-Ship Supplies-Marine Equipment

Cunningham Electric Auxiliaries

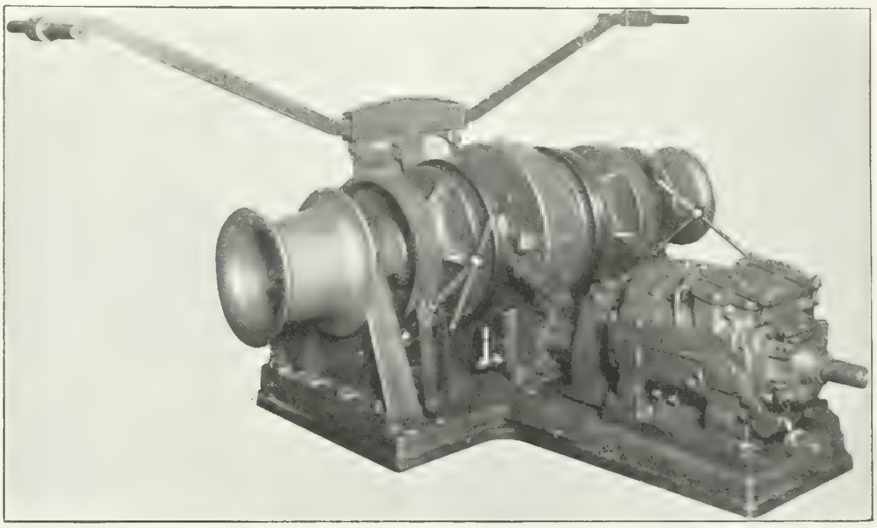
ALLAN Cunningham of Seattle, manufacturer of marine auxiliary machinery and reduction gears, reports his shop busy on a number of orders in production. Included in these orders are auxiliaries for vessels building in Atlantic Coast shipyards.

The largest order now in this shop is that for the six double-electric steering gears complete for the six double-end diesel-electric ferryboats now building at San Francisco Bay shipyards for the Southern Pacific Company and the Northwest Pacific Railroad. The mechanical arrangement of this steering gear is somewhat different from the standard type and will, it is believed, show an improved efficiency for this particular service.

An electric warping winch is under way for the large diesel-electric seagoing tug now building at the yard of William Muller at Wilmington, California, for the Wilmington Transportation Company. This winch is a repeat order based on the very satisfactory performance of exact duplicates installed by Cunningham last year on the diesel-electric tugs John N. Stewart and Milton S. Patrick for the Wilmington firm.

Other interesting jobs are the electric anchor windlass and electric steering gear for a large schooner yacht now building at the yard of W. F. Stone & Son, Oakland, California, and the electric windlass, electric warping winch, and electric steering gear for the new diesel-electric oil tank barge now under construction at the yards of the Sun Shipbuilding & Drydock Company, Chester, Pennsylvania, for the Tidewater Oil Company.

Mr. Cunningham recently furnished the drum type straight electric steering gear for the new diesel-electric ferryboat Golden State of the Golden Gate Ferry Company fleet, as well as the hand steering gear for the same vessel.



Cunningham electric anchor windlass and winch with emergency hand gear.

Another recent installation which is giving complete satisfaction is that of the electric windlass and hand steering gear for the new motor patrol boat Brant, built by the Kruse & Banks yard of Coos Bay, Oregon, for the United States Bureau of Fisheries.

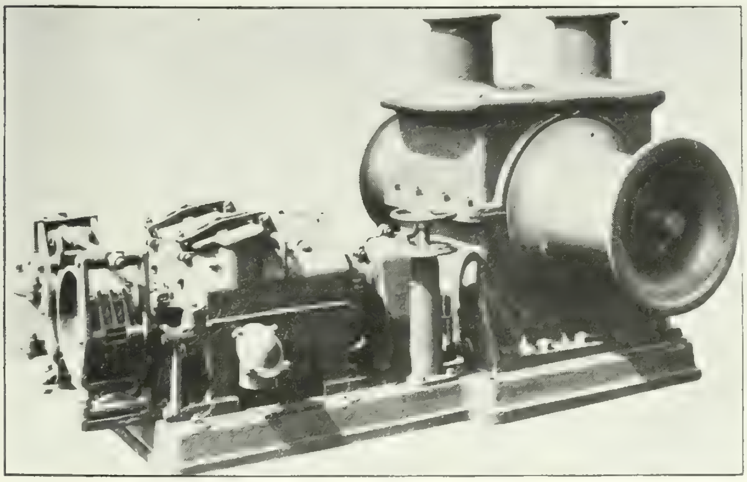
The Cunningham electric anchor windlass is a great favorite with Pacific Coast yachtsmen and power boat owners and a large number of these efficient labor savers are now in the shop for yachts and cruisers now building in the many boatyards of Puget Sound and adjacent waters both of the State of Washington and the Province of British Columbia.

Trade Literature

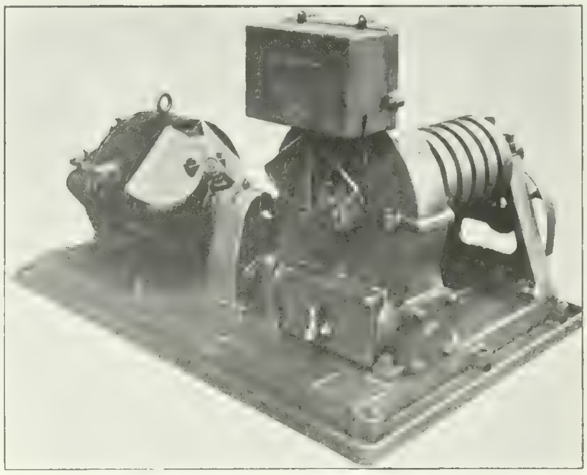
The Enchanted Isles of the Pacific —Hawaii direct from Los Angeles. These are the two titles given to one of the most ambitious and, we believe the most artistic brochures issued by a steamship company's advertising department for the purpose of enticing travelers to their routes and ships.

The Los Angeles Steamship Company has recently issued this little booklet on their Los Angeles-Honolulu service. The brochure contains only a few pages and is about 7 by 10 inches in size; but its cover and pages are replete with artistic color drawings and paintings in vivid tropical hues depicting the delights of Hawaii and the comforts and pleasures of a sea voyage on the liners of the Los Angeles Steamship Company.

As this is something new in the way of steamship booklets, and since it is also an artistic success, a great deal of credit is due the Advertising Department of the Los Angeles Steamship Company who designed and published the book under the guidance of S. P. Trood.



Cunningham electric warping winch



Cunningham electric steering gear.

85 Per Cent Magnesia

MAGNESIA has long been used as a base for insulation materials used to prevent the radiation of heat from the surfaces of boilers, pipes, engine cylinders, and other heat containers. "85 per cent" Magnesia, which is so familiar to steam users as a covering for pipes and lagging for boilers, is manufactured at the factory of the Plant Rubber and Asbestos Works at Redwood City, California.

The source of magnesia used in the pipe covering manufactured by this firm is bittern, the liquid residue from sea water after salt has been taken out by evaporation. Bittern is a very concentrated, exceedingly acrid and bitter liquid containing, in solution, a large proportion of magnesium salts. A large supply of bittern is available at Redwood City from the salt works on the neighboring marshes.

This bittern is made to give up its magnesia content by treating it with a solution of trona, a natural salt gathered at Sells Lake, California. The reaction between the trona and bittern precipitates pure white magnesia. After the surplus liquid has been pressed out, this magnesia, in the form of a pulpy mass, is mixed with asbestos fibre in the proportions of 15 parts of asbestos to every 85 parts of magnesia. The mixture is then put through filter-former presses, in which practically all of the water is removed and the asbestos-magnesia mixture is formed into the sections desired for commercial purposes. These forms are piled on iron rack cars and thoroughly dried in oil fired ovens. After taken from the ovens, they are run through machines which mill them to exact sizes and cut them off to required lengths.

Pipe coverings are molded in half circle sections in sizes from 1 inch to 10 inches and cut off in standard lengths. In all of these sizes the two half-circles are placed together for shipment and are fastened with a waterglass cement, which permits the parts to be easily separated for installation. For larger pipe sizes the material is molded in blocks forming an arc of the circle.

All cuttings and scrap from the manufacturing process are utilized in making the magnesia cement which is used for filling out corners, cementing cracks, and for molding around fittings in order to make a perfect insulation of the whole job. The only waste product in connection with this factory at the present time is chlorine gas. Chemists are busy experimenting, and undoubtedly a method will soon be found by which this chlorine gas also may become a commercial by-product.

The Redwood City mill of the Plant Rubber and Asbestos Works.

The factory at Redwood City also manufactures a product known to the trade as Prasma, which is a very useful insulating material in locations requiring a high heat resistance. Prasma will not calcine under 1200 degrees Fahrenheit. Magnesia calcines at about 750 degrees Fahrenheit. Consequently in steam plants using very high superheats, Prasma is used next to the hot surface and in turn is covered with standard "85 per cent" magnesia, the combination giving very satisfactory results.

The insulating material, manufactured by the Plant Rubber and Asbestos Works, is not only 85 per cent magnesia, but is also 85 per cent Californian, the asbestos used being the only ingredient brought from outside the state. Products of this firm are rapidly finding their way into export business and large shipments have recently been sent to the Orient. In industrial uses, installations have been made all over the Middle West and Pacific Coast.

At the San Francisco factory of the Plant Rubber and Asbestos Works, a large force of men is kept busy making up air shell sheathing and various rubber and packing specialties, including rubber port strips, special asbestos gaskets, and all sizes of flax packing.

Sydney Plant, president of the Plant Rubber and Asbestos Works, has a thorough knowledge of the marine engineering profession. He came to the Pacific Coast first in 1890 in the British steamship Coptic. After a number of round trips, he established himself in business in San Francisco in 1896, manufacturing and selling steam packings and insulating goods. The present firm is the outgrowth of the work of Mr. Plant in this line. Associated with the Plant Rubber and Asbestos Works are Charles A. Wright, first vice-president; Milton S. Sprague, second vice-president; Elliot Price, secretary and treasurer. Sam Gillis, who is known officially to the company as assistant secretary, is a very well known figure on the San Francisco Embarcadero and is one of the most popular marine salesmen operating on San Francisco Bay.

Trade Literature

How to Order Brass, Bronze, and Nickel Silver, is a handbook recently issued by the Chase Metal Works.

The purpose of the book is to point out what properties in brass are desirable for certain typical uses and how to order such material wisely. The book contains 38 pages containing a clear account of the manufacture of brass and its alloys and of their adaptability to various uses. It is well illustrated with half-tones of actual photographs and with marginal drawings. Tables of the common uses and tempers of wrought copper alloys; approximate average physical properties of wrought copper alloys; Chase sheet tolerances; Chase wire and rod tolerances; and Chase seamless brass and copper tubing tolerances, make this little volume a very handy reference book on brass.

The book is being distributed free on application to The Chase Companies of California either at San Francisco or Los Angeles.

Chase Condenser Tubes. The Chase Metal Works has issued a 31-page booklet on the manufacture of condenser tubes.

The book gives a general outline of the manufacture of condenser tubes and then step by step outlines the process of the manufacture of Chase tubes of various mixtures. As most users of condenser tubes order them according to specifications, the necessity for particular attention to each order so that the material will give a maximum life in service is clearly brought out. The booklet contains many features in connection with the ordering of condenser tubes that should be enlightening and of profit to marine engineers.

This booklet "Chase Condenser Tubes" may be had free of charge by addressing this office or The Chase Companies of California either at San Francisco or Los Angeles.

Marshall-Newell Marine Hardware

THE extensive hardware and supply business of the Marshall-Newell Supply Company of San Francisco has been built up from a small beginning by strict application to business and a determination to succeed through straight dealing.

Joseph H. Marshall and George F. Newell are both Californians. After an education in the public schools of California they both entered the employ of Dunham, Carrigan & Hayden, pioneer hardware merchants of San Francisco. Both of these boys took to the hardware business as a duck takes to water, and so both were willing to buckle down to the hard grind that in those days was the lot of a boy in a hardware store. Sweeping floors, washing windows, building fires, delivering goods, running errands, and all sorts of utility work from mending hose to sharpening lawn mowers kept the boys busy for the ten-hour shift. Several years of this routine was considered essential training for the responsible position of counter salesman, and several more years behind the counter entitled the worker to act as office salesman.

The Marshall-Newell Building, San Francisco.

After twenty years of this training, Messrs. Marshall and Newell decided they were ready, and so, in February 1906, they opened a marine hardware emporium on Sacramento Street close to the San Francisco Embarcadero. Being on very friendly terms with the older hardware houses and having through long experience an excellent knowledge of the trade, these two men were rapidly working up a very brisk business when April 18, 1906 brought the disastrous earthquake and fire that practically wiped out the business district of old San Francisco and completely eliminated the store and stock of Marshall-Newell. These men, however, had the true California pioneer spirit. Undaunted by the catastrophe, they immediately began making arrangements to resume "business as usual," and before the ashes of the fire were cool they had signed up for a lease of a property on Steuart Street, which had a small building that had in some way escaped the fire. Here, working overtime and with renewed ambition, they began to sell a stock of hardware which they had obtained through a Seattle firm, who with characteristic western friendliness, came to the rescue when it was found impossible to get stocks out from the East.

Marshall-Newell grew and prospered and soon a two-story brick building appeared on Steuart Street, a large part of which was occupied by the firm. San Francisco, emerging Phoenix-like from her ashes of 1906, rapidly regained her prosperity and mastery of Pacific shipping. The new marine hardware firm added new lines to their stocks and when, in 1914, fire again destroyed this plant, they were ready and immediately rebuilt on larger and broader lines, without losing a day of sales.

Firmly convinced of the bright future ahead of San Francisco and for Pacific Ocean shipping, Marshall-Newell, in 1918, seized an opportunity and secured the large building at Mission and Spear Streets, which they now occupy. A picture of this building is reproduced herewith. In addition to the large stock carried in this building, they occupy considerable warehouse space. The building affords ample space for display, is fire proof, and is designed to facilitate speedy transaction of business and efficient handling of stock.

The personnel of the establishment is composed of some seventy people, many of whom have been with the firm for years. Particularly worthy of mention are Percy Converse and Sam Alden. These two have been working for Marshall-Newell since the company was formed. So long has the latter of these two been accepted along the San Francisco waterfront as just "Sam" that the name Alden has been almost forgotten. The writer, a personal friend of twenty-years' standing, had to dig it out of old records.

Among the lines of high class hardware handling by Marshall-Newell, as agents, are Lunkenheimer, Brown & Sharp, Chicago Belting Co., Yale & Towne, Reed Manufacturing Co., Ashcroft Manufacturing Co., Youngstown Sheet & Tube Co., Cleveland Twist Drill Co., Penn oilers, Starretts tools, Heller Bros. files, and many other notionally known lines.

Electrical Firm Busy

THE firm of Ets-Hokin & Galvan, electrical contractors of San Francisco and Wilmington, report that they have supplied banks of Edison storage batteries to H. O. Harrison's yacht K'Thanga, John Barrymore's yacht Mariner, and to Valentine's new yacht.

They have recently installed a complete Kohler automatic generating set on the cruiser yacht Four Winds for Stanley G. Harris.

They have also sold several of the American Machine & Foundry pumping units.

The firm of Ets-Hokin & Galvan have been appointed agents for the Redwing Gas Engine Company and will in a few weeks carry stocks of these engines, as well as parts and supplies. The manager of the Redwing Corporation visited San Francisco recently and chose this firm as representative.

The southern California branch of the Ets-Hokin & Galvan Co. carry, at the Wilmington store, a full stock of ship chandlery in addition to the electric units specially built by them for workboats and small yachts. These units are gas engine driven, of from 300 to 750 watts. This gives plenty of light for small vessels at low voltage, and the plants are so small that they can be tucked away almost anywhere.

Rushing Work on the Malolo

THE marine fraternity on the Pacific coast is looking forward with eager anticipation to the arrival of the superb passenger liner Malolo, which the Matson Navigation Company are planning to put on the regular run from San Francisco to Honolulu early in the spring of this year.

Progress toward completion of the steamship Malolo, building at the plant of Wm. Cramp & Sons Ship & Engine Building Company, Philadelphia, for the Matson Navigation Company, is indicated by the fact that already the contract for the final hardwood flooring in the lounge has been awarded.

This contract goes to S. W. Heaton, of Philadelphia, who will furnish the labor and material for laying a complete hardwood dancing floor in the lounge, the border combining walnut, oak and maple parquet, while the main flooring will be of oak.

Other contracts recently awarded include:

Charles Mundt Company of Jersey City has received the order for the vent grille panels.

The order for the grilles for the dining saloon, coffee rooms, reception room, and "A" deck foyers has been placed with the Werner Foundry Company, Inc., of Lansdale, Pa.

John A. Popp, Philadelphia, has been given the contract for making the patterns for casting the grilles for the various reception and entertainment rooms.

J. W. Atlee has received the contract for 2750 Atlee cargo batten cleats.

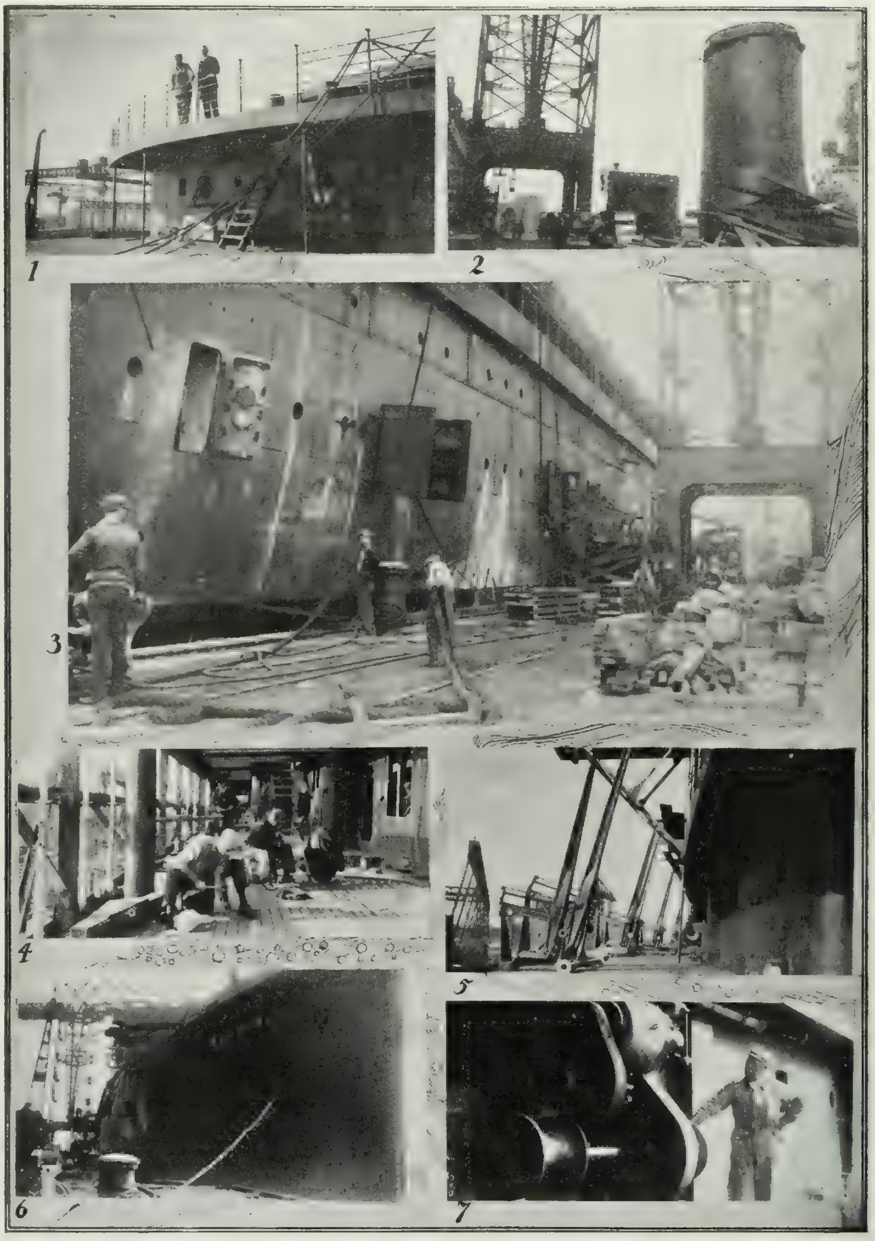
The National Tube Company received the order for the anchor chain pipe for the Malolo of special extra heavy pipe.

The Consolidated Shipbuilding Corporation, Morris Heights, New York, has been given the contract for furnishing four bits for the Malolo.

The contract for steel lockers for the hospital and crew's quarters of the Malolo has been awarded to Edward J. Darby & Son, Philadelphia.

The C. J. Tagliabue Mfg. Co., of Brooklyn, has received the contract for supplying the dial thermometers for fuel oil tanks for the Malolo. This equipment consists of fuel oil tank thermometers with vapor tension indicating dials which will range from 50 to 200 degrees Fahrenheit.

The Malolo will be equipped with four Clearview screens for use in bad weather. The contract for these Clearview screens has been given to the Chadburn Engineering Company of Troy, New York. Two will be of the pedestal type screens with pelorus, and two of the window type of screen.



1. After section of the Malolo's A deck and navigating bridge deck. 2. The forward funnel showing its two section—the upper section in the background being painted. From keel to funnel rim will be 124 feet. 3. Striking view of starboard after quarter. Note the graceful effect of the tumble home and the promenade deck overhang above. 4. Calking the teak promenade deck. 5. Starboard battery of Stewart life boat davits. 6. Bow view of hull. 7. One of the battery of Diehl motors for handling lifeboats. Guy Jackson, inspector for William Francis Gibbs, looking things over.

The Fiat Metal Manufacturing Company of Chicago will furnish the partitions and doors for the public deck and the engineer officer's lavatory.

The Pennsylvania Forge Company have received the order for the forge and steel flanges for the slop chutes of the Malolo. The wrought iron pipe for the slop chutes has been contracted for with the Reading Iron Company of Philadelphia. The Pittsburgh Screw & Bolt Company have received the order for the bolts and nuts for the slop chutes.

The Malolo will have two completely equipped motion picture theatres, one inside and the other on the deck aft of the after funnel—the after funnel itself containing a projection booth. The Art Metal Construction Company of Philadelphia has received the order for the motion picture film safe for the storage of films on the ship. This picture film safe will have a capacity of 100,000 feet of film, and is the type and construction approved by the National Board of Fire Underwriters. The hardware of this safe will be of bronze, polished.

The flag outfit for the steamship Malolo will be furnished by Degrauw, Aymer & Co. of New York.

McEverlast Paint--A California Product

THE workboat hull, exposed as it is to the corroding and fouling action of harbor water, requires a paint which will stand up well. The problem of making paint that will prevent marine growths and corrosion is a big one. The teredo is a menace particularly to wooden hulls, and most Pacific Coast workboats are of such material. Marine growths will attack any hull built of any commercial material.

So chemists and paint manufacturers have for years been experimenting on different pigments and mixtures to find the most serviceable and economical surface covering. A mixture that will apply easily and dry quickly is needed, because boats when dry-docked cannot afford to be left there until slow drying paints harden. In addition to the features above noted, the paint must be reasonably priced, for semi-annual hull painting absorbs a lot of paint.

The Everlasting Paint & Sales Company, after exhaustive experiments and trial for many years, recently placed on the market a marine paint which is claimed to have all the characteristics that make it a good buy for the workboat and shipowner. This paint is a good surface protector not only for floating property, but also for wharves, bulkheads, interiors of tanks, bilges, chain lockers, or any part of a structure afloat or ashore that is liable to be attacked by corrosive gases or rust.

This paint is a California product. It is manufactured at Van Nuys, where extensive factories and laboratories are maintained. This location is admirable for the purpose, as considerable of the material used in the paint is mined nearby and it enjoys the same terminal freight rate as Los Angeles in shipments through Los Angeles harbor. Considerable quantities of Trinidad asphalt are used in manufacturing this paint, and this is delivered to the factory free of local freight charges.

Besides purely marine paints, protective coatings are made for almost every industrial use and of particular adaptation to wood, steel, concrete, iron, or any of the fibrous materials such as cloth, fiber, or paper.

McEverlast is the trade name under which all of the paint preparations manufactured by the Everlasting Paint & Sales Company are sold. McEverlast is manufactured in many attractive colors, such as bronze, silver, golden and dull grey, besides the glossy black of the asphaltic base paint. The bright colored McEverlast paints are known as Luminite from their metallic and luminous luster, although there is no trace of aluminum in them. McEverlast Luminite is noted for its ability to withstand great ranges of temperature and still retain all of its valuable characteristics.

The darker paints are claimed to be absolutely water-proof under all circumstances and are specially recommended for boat and ship decks and bottoms, water, oil and gas pipes. For tanks, smoke stacks, boiler fronts, dams, conduits and flumes, auto tops, frames, spare tires, batteries and such uses, Luminite is recommended.

The firm also manufactures a concrete water proofing liquid which is of great value in road building and does away with the labor and expense of covering newly laid concrete with water and dirt. A finished concrete roadway or floor, thoroughly coated with this new liquid, will cure nicely in the open air.

Three San Francisco Bay boats have recently been treated with the McEverlast products. One is the Rover, a workboat owned by Osborn & Barnholdt of Oakland. Another, a pleasure cruiser owned by Barney Sandstrom of Oakland, is being painted throughout with Luminite colors, creating a very striking and beautiful effect, the blending of bronze, silver and gold tints both inside and outside of the vessel being an original idea of the owner, who claims he will have the prettiest pleasure craft on San Francisco Bay. The third boat, also a cruiser, and owned by W. J. Smith of Oakland, is being finished in McEverlast paints.

F. McRae of Los Angeles is secretary-treasurer and founder of The Everlasting Paint & Sales Company. The firm enjoys a high commercial rating and is well financed. The Northern California district is under the management of O. G. Hopkins, with offices and a large warehouse stock in San Francisco.

Haskelite and Plymetl Active in Ship-Building During 1926

THE year just closed has been one of activity in the application of Haskelite and Plymetl, the structural plywood products, to ship construction. As has been the case for several years, a majority of leading contracts for ship joiner work specified these materials. On the West Coast, notable examples are the President Arthur, which is being reconditioned by the Los Angeles Shipbuilding & Drydock Corporation, and the two Key System Transit ferries built by The Moore Dry Dock Company of Oakland, Calif.

The superior strength of Haskelite permits much thinner bulkhead construction than ordinary tongue and groove standards. This has been one of the principal factors in the acceptance of this material by naval architects and ship operators.

Plymetl, the armored plywood, has in addition to the strength of its companion material the resistance of steel to surface indentation and fire. These qualities have appealed strongly to many shipping men for use in galleys, crew's quarters, bathrooms, and for doors. On the Key System Transit Company's ferryboats even the seats were of Haskelite and the life preserver racks of Plymetl.

New Steamers Use Haskelite

Among other important 1926 contracts were the Atlantic coastwise passenger and freight steamers Chatham, Dorchester, and Fairfax, built for the Merchants and Miners Transportation Company by the Newport News Shipbuilding & Drydock Company and on which large quantities of Haskelite and Plymetl were used. Three passenger and freight steamers, the Algonquin, Iroquois, and Shawnee, built for the Clyde line by Newport News shipyard, used Haskelite panelling in passenger accommodations. Two new car ferries built on the Great Lakes for the Grand Trunk Line, several large yachts, and a number of cruisers have been equipped with Haskelite and Plymetl.

The United States Shipping Board has, during 1926, carried on a large program of reconditioning work on steamers and of conversion of steamers to motorships. In the reconditioning of the steamers President Harding and America, Haskelite panelling was specified for many applications. Other Shipping Board steamers using large orders of Haskelite in 1926 were Tampa, Unicoi, Sawokla, City of Rayville, West Honaker, West Cusseta, and Crown City.

LARGE ORDER FOR MAXIM SILENCERS

AN order for twenty-four ten-inch heater silencers for six ferryboats under construction by the Southern Pacific Railway Company, San Francisco, has just been placed with the Maxim Silencer Company of Hartford, Connecticut. These boats are to ply between San Francisco and Oakland, and will carry ninety automobiles and several hundred passengers. Each boat is to be equipped with four diesel engines and electric drive. The Maxim Silencers contain heaters, and in addition to silencing the noise of the exhaust utilize the heat of the exhaust.

Westinghouse Marine Electrical Installations in 1926

By W. H. Cope, Assistant Director of Engineering, Westinghouse Electric and Manufacturing Company.

STEEL Electrician is the first diesel-electric drive vessel in Great Lake service to utilize the complete voltage control system. The propulsive plant consists of three 205 kilowatt diesel engine driven generators each with a direct-connected 30-kilowatt auxiliary generator, supplying power to a 750-horsepower, 690-volt, 135-revolutions per minute, propelling motor. The system of control allows the propeller to be operated at any speed from zero to 135 revolutions per minute in either direction by small increments of change, a performance vital to ships operating on inland waters. This vessel has been in service since May 1, 1926, and has demonstrated many superior features in comparison with her direct-driven sister ships.

This is the first installation to employ a true load limiting device. This device prevents overloading of the engines, but interferes in no way with the control. Previous load limiting devices have operated on current only and were therefore really torque limiting devices.

The cam-operated contactor set-up group for connecting various auxiliary busses to exciters made its first appearance on this vessel. The arrangement makes it impossible to parallel the generators, but provides a very flexible distribution of auxiliary load.

Due to the eminent success of the Pennsylvania Railroad's diesel-electric drive tugboat No. 16, put in service in 1924, eight diesel-electric tugboats have been placed in service in 1926 with Westinghouse equipment. Of chief interests are the two Pennsylvania Railroad drill boats, used for making up tows in what might be called switching service. These boats have propellers and rudders at each end, and are the first of this type to be electrified. The Pennsylvania Railroad's tug Wicomico is the first sea-going tug for regular service to be electrified. This boat is in the car float towing service between Cape Charles and Norfolk, Virginia.

An interesting feature of these boats' equipment is that they embody completely dead-front switching and control panels, a construction introduced in this service by Westinghouse and used on fifteen Westinghouse-equipped diesel-electric vessels, the only vessels so far thus equipped.

The past year witnessed the first diesel-electric tugboats on the West Coast. The Wilmington Transportation Company placed in harbor and sea service, the John N. Stewart and the Milton S. Patrick, which are the first diesel-electric tugboats to carry three control stations, i.e., in the pilot house, on the after deck, and in the engine room.

Although the large sea-going yacht has to some degree given place to the luxurious house-boat, there are still many who prefer the more seaworthy and venturesome craft. Commodore Arthur Curtis James' famous Aloha with her towering bark rig, carries also a diesel-electric auxiliary power drive, which this year replaced the steam plant formerly carried. She is the largest diesel-electric yacht in the world. Her propulsion plant consists of three 175-kilowatt, diesel driven generators; three 30-kilowatt, direct-connected exciters; and a 640-horsepower, double unit propelling motor. The scheme of the drive and its arrangement are similar to diesel-electric propelling installations found on larger vessels.

The first diesel-electric fireboat in the world, the Port Houston, went into service during 1926. This form of propulsion is eminently suitable for fireboat service and has many advantages in comparison with other drives, and the performance of this vessel since going into service has fully justified its adoption. Her first practical service was reaching a fire two miles distant from her station in ten minutes after the alarm.

The Key System Transit Company of San Francisco will soon begin operating two turbine-electric ferryboats—the largest in the world of this type. The boats are double ended, having a 2600 horsepower, 212 revolutions per minute motor at each end. All electrical equipment is arranged for Westinghouse variable voltage control from the bridge. These boats represent the largest direct current propulsive plants yet built.

Several diesel-electric ferryboats are now being built for the Golden Gate Ferry Company and the Southern Pacific Company, San Francisco.

The submarine boat constitutes a field in which diesel engines and electric motors are used perforce. The equipment for Submarines V-5 and V-6 embody the latest developments of machinery and control for this exacting service. The plant consists of two 1250 horsepower propelling motors supplied from storage batteries. The motors also serve as generators for charging, and there are two 300-kilowatt auxiliary sets to supply auxiliary power and assist in charging the batteries.

Incident to the United States Shipping Board's big conversion program is the largest order for electric deck auxiliaries ever placed. This equipment for each of 14 vessels includes over ten deck winches, one warping winch, one anchor windlass, and one steering gear, making a total of 182 motors and controllers. The motors, with the exception of the steering gear, will be completely waterproof and mounted on exposed decks.

The control is of three types, such as the magnet-operated contactor type, the manual cam-operated contactor type, and the manual cam-operated snap-action contactor type. This includes all applicable types of controllers for this service and will enable close comparison to be made. The first mentioned is remote, electrically controlled; the second and third types are remote manual control consisting of rods and bell cranks. This is the first application of remote manual control for this service.

Westinghouse has perfected the snap-action controller sponsored and conceived for this service by the United States Shipping Board engineers. Certain phases of its mechanism are new, and preliminary tests indicate it has considerable merit.

Another advance is the perfection of an electrically driven, direct geared, steering gear operating in conjunction with a Sperry automatic steerer known as the Metal Mike. This involved close engineering cooperation between the companies involved.

The Clyde-Mallory Steamship Lines now operate between New York and Jacksonville, Florida, three combination cargo and passenger vessels, the Cherokee, Seminole, and Mohawk, equipped with electric cargo handling machinery and turbine generators. This type of vessel presents interesting engineering problems, in that much of the loading and unloading is done through hatches that are "blind;" i.e., covered by other decks above, instead of being open to the sky. Such limited headroom at the top of the hatch, of course, necessitates very tedious and accurate manipulation of the winches. However, the equipment has so definitely proved its superiority to the former steam-driven cargo handling machinery, that the Clyde-Mallory Lines are not only installing electrical deck machinery and generating sets on three new ships, but have greatly extended the use of electrical auxiliaries.

The Port of Los Angeles, Annual Report 1926. This report of the Harbor Commissioners of the City of Los Angeles is for the fiscal year ending June 30, 1926. It is made up in booklet form, nicely printed on coated stock, and is attractively illustrated with scenes of the port facilities furnished by the city, as well as a great deal of general information on the subjects of port facilities, railroads, steamship lines, etc.

Complete Cory Communication

THE three new ships of the Merchants & Miners Transportation Company, steamships Chatham, Dorchester, and Fairfax, built by the Newport News Shipbuilding & Drydock Company, are now completed and in service, and are excellent examples of the highest type of shipbuilding construction and equipment for coastwise passenger ships.

Among the many problems that presented themselves to the designers and the owners of these ships prior to their construction was the safety of the ship, while uppermost and of major importance, the comfort of the passengers and the service rendered to them during their short stay aboard ship was the cause of considerable thought and the reason for a countless number of conferences between the owners' representatives, and the engineers of a great number of companies manufacturing devices for marine installation.

Among these important problems was that of communication means between each stateroom and the steward's office. A passenger going aboard a ship operated by almost any American steamship company is unable to determine in advance what means he shall use if he desires ice water, an extra blanket, or any of the various conveniences that are often required at extremely inconvenient hours. Many ships of the size of these three recently constructed are provided only with an ordinary call bell system. This requires and necessitates on the part of the passenger, pressing the button, waiting sometimes a considerable period for the answering knock at the stateroom door imparting the desire to call boy or steward, and then waiting another period for the messenger to return.

The Merchants & Miners Transportation Company decided after a consultation with the engineers of Chas. Cory & Son, Inc. to install the most modern type of telephone system with a central operator. The telephone itself is novel for ship installation, consisting of a wall box and a hand telephone set complete such as we are accustomed to associate with telephones used in the various European countries. This type of telephone has proved highly satisfactory. The passenger grasps the handset and applies the receiver to his ear, the transmitter automatically takes its place in front of his mouth, and regardless of the movement of the ship the position of this transmitter is maintained without difficulty. Telephones installed on nearly every ship prior to this installation were of the wall box type where it was necessary to apply the mouth directly to the instrument located on the bulkhead. Any movement of the ship was more than likely to throw the passenger out of his position while attempting to talk in the transmitter, and frequently resulted in a personal injury. In this modern type of instrument removing the handset from the wall box makes a direct connection to the central operator. The passenger conveys his requirements once only. The messenger goes to the stateroom once only and completes the desire of the passenger in one trip, a saving of time and inconvenience to the passenger is a natural result.

In addition to the most modern type of telephone system installed on these ships, Chas. Cory & Son, Inc. have furnished the equipment for installations of mechanical engine docking and steering telegraphs, navigating telephones, complete electro-pneumatic fire alarm systems, electric whistle valves and controls, and a considerable amount of miscellaneous incidental equipment, so that these ships may well be considered as Cory equipped, and have therefore instruments and appliances of the highest possible quality.

Rivet Trouble in Tank Steamers

AT the annual meeting of the Society of Naval Architects and Marine Engineers, W. Bennett, senior marine surveyor of Lloyds Register at the Port of New York, read a very interesting paper on the subject of Corrosion, which led to considerable discussion. A. C. Holzapfel, of the International Compositions Company, in discussing that part of Mr. Bennett's paper which referred to corrosion problems in tankers, directed particular attention to the deterioration of rivets in vessels carrying oil.

Mr. Bennett's paper referred to sixteen vessels which had to be largely reriveted. Out of these only two were general cargo vessels and there were fourteen bulk oil carrying tankers. This is remarkable when we consider that tankers are much more carefully and strongly built than ordinary cargo vessels, particularly as to the riveting, since an oil-tight job has to be made. In the case of the freighters the damage to the rivets was stated to have been due entirely to corrosion, while in the case of the tankers the rivet trouble was largely due to the rivets having become loose.

It is a well known fact that pneumatic riveting does not fill the hole with the rivet as perfectly as either hydraulic riveting or hand riveting; but on the other hand a much larger number of cargo vessels are built than tankers, and pneumatic riveters are used equally on both. Yet tankers apparently show a larger proportion of loose rivets.

Mr. Holzapfel suggested that while pneumatic riveting does not in many cases fill the rivet hole, this empty space in cargo vessels is soon rusted up and filled by the action of sea water; whereas in tankers, if a rivet is not tight, oil works in between the rivet and the shell, protects the rivet from corrosive action, and becomes a lubricant, helping the rivet to work itself loose and form a weak spot. Other rivets in the neighborhood, becoming overstrained, also begin to work, lubrication assists this working, and so the weakness spreads from rivet to rivet and from plate to plate.

If this theory is correct, and it certainly sounds plausible, the use of iron rivets, as suggested by Mr. Bennett's paper, would help; but they also would be subject to the process of lubrication though in a lesser degree than in the case of steel rivets. Mr. Holzapfel suggests that a better method of protection would be to isolate the inner skin of the tanker from the oil or distillate cargo, and offers for this purpose the material Rubshell, a quick drying paint which has been recently developed by the International Compositions Company and which is insoluble in gasoline or in any of the hydrocarbon distillates and their vapors. Rubshell is acid proof and proof against electrolysis. It is quick drying, very adhesive, and has been, during the last year, successfully used at several refineries in condenser boxes and around treating agitators and cooking kettles where the severest conditions prevail.

This material, therefore, would seem to be eminently suited to protect tankers against the loose rivet evil and against corrosion. Rubshell is ideal for use in tankers, especially as it is a perfect protection from corrosion due to sulphur compounds, sulphur fumes, and corrosion due to the deposit of hydrocarbon vapors on the underside of decks and of tank covers. In the majority of tankers salt water is used for ballast in returning light, and where such vessels have carried gasoline all ordinary protective coverings will have been dissolved in spots by the light hydrocarbons, leaving the plates open to action of the sea water.

Rubshell is now available for commercial use and is being marketed by the International Compositions Company of New York.

The Worthington Company, Inc. now has on exhibition at 160 Spear Street, San Francisco, one of their 120-horsepower, 2-cycle, direct reversing, marine diesel engines. V. A. Stout, oil and gas engine sales manager for the company in San Francisco takes great pride in showing the engine to interested visitors.

Electrical Developments in The Marine Field in 1926 As Measured By General Electric Company Installations

By D. W. Niven, Manager, Federal & Marine Department, General Electric Company

As a result of the successful operation of a 13,000-ton self-unloader type of bulk freighter equipped with turbine-electric drive and electrical unloading equipment, which was put into service in July, 1925, a still larger ship of this class is now under construction. She will be the largest bulk freighter on the Great Lakes, with an over-all length of 637 feet and a beam of 65 feet, and her entire equipment will carry out the most advanced engineering practice both in regard to the steam conditions and to the completeness of the electrification of auxiliaries.

The turbines will be supplied at 300 pounds pressure and a total temperature of 700 degrees Fahrenheit, and will operate on a vacuum of 28½ inches. These steam conditions represent a distinct advance both in regard to pressure and temperature for ships of this class. The power developed will be normally about 4200 shaft horsepower, but the equipment is capable of giving a maximum continuous output of 4800 shaft horsepower.

The electric lake service auxiliaries are driven from a motor-generator set which operates from the main unit, while the electric equipment for unloading cargo in port is driven directly from the main unit. Under way a variation in the revolutions per minute of the propeller is accomplished by varying the speed of the turbine. In port, the main turbine will be run at constant speed and, in case maneuvering is required simultaneously with the unloading operation, variation in the propeller speed can be accomplished by mean of resistance inserted in the propelling motor secondary circuit.

Diesel-electric propelling equipment is under construction for three tankers of 7000 deadweight tons each bought by the Atlantic Refining Company from the United States Shipping Board to be converted from steam to diesel-electric drive. These are single-screw ships and generating equipment for each consists of three 525-kilowatt, 250-volt, direct-current machines driven by three 850-brake horsepower engines, each generating unit being provided with a 50-kilowatt, direct-connected auxiliary generator. The three main generators are normally operated in series and supply current to an 1800-shaft-horsepower, 90-revolutions per minute, 750-volt shunt-wound propelling motor.

The first diesel-electric dredge on the Great Lakes, the Sandmaster, was placed in service in May, 1926, and is the most advanced vessel of her type in the world today.

Like the tankers just referred to, the Sandmaster was originally a United States Shipping Board craft and operated by steam, but her conversion to diesel-electric drive permitted not only more economcal operation of the propelling machinery but also rendered possible the most flexible arrangement and control of the large pumps and other auxiliaries required for the operation of a suction dredge.

A new 15-inch hydraulic dredge for the U. S. navy utilizes 3-phase 60-cycle alternating-current motors. The main dredge is equipped with a 600-horsepower 165/265-revolutions per minute motor, and the cutter with a 75-horsepower 300/600 revolutions per minute motor. The main dredge motor operates at 2200 volts, but 220-volt service is provided for the auxiliary equipment.

The most powerful dipper-dredge ever constructed, the Crest, was placed in service and is now being used in rock removal work in New York Harbor. The primary power consists of two 600-horsepower diesel-engine-driven generators and more than 1400 horsepower in motors is required for the dredging operations. At present 10-cubic yard dippers are being used on account of the severity of the work, but in normal service buckets up to 15 cubic yard dippers can be utilized. The pull on the dipper bail is 350,000 pounds, or more than twice that of the largest size dredges used in the construction of the Panama Canal.

Propelling equipments for four diesel-electric ferries represented a greater power for this type of craft than has heretofore been used. These ferries are under construction for the Southern Pacific Company, San Francisco, and each of these double-ended boats will be equipped with four 275-kilowatt direct-current generators individually driven by four 450-horsepower engines, the two propellers being each driven by a 1250-horsepower 1000-volt double armature direct-connected motor.

Two tug-boats which are under construction at Balboa shops for service on the Panama Canal will be the largest and most powerful diesel-electric craft of their type, each having a maximum continuous rating of 900-horsepower and an over-all length of 150 feet.

Two tugs, each 108 feet long and 26 feet beam, under construction for the New York Central Railroad, are indicative of the most modern arrangement of diesel-electric propelling machinery for this type of craft. Each boat will be provided with two 270-kilowatt, 265-revolutions per minute, 240-volt compound-wound generators, each driven by a 400-horsepower diesel engine, the propelling motor being of the double-unit type and rated at 650 horsepower, 480 volts, and being normally operated by the two generating units connected in series.

The type of automatic mooring winch which was originally designed for marine service was successfully applied for mooring an airship to the Ford airmast at Detroit, and its satisfactory operation has resulted in the decision to equip the Scott Field mooring mast near St. Louis with a similar machine.

An electric automatic towing machine was installed on the tug William A. Lydon operating on the Great Lakes. The electrical equipment comprises a 50-horsepower motor, a contactor panel, and two master switches, one an automatic switch operated from the tension-responsive device in the mechanical gearing, and the other a manual switch.

Improved operating characteristics were secured in the design of a new single-geared type of motor-operated deck winch having the advantage of an automatic accelerating control feature which limits the current used regardless of the manner in which the control handle is operated.

The driving motor is designed so that a minimum accelerating torque is required on average loads. Single-geared operation is therefore feasible and quicker acceleration and more rapid cargo handling are secured with a reduction in the amount of current consumed.

The master switch for the control of the winch provides 4 points rheostatic hoisting and 5 points power and dynamic braking lowering. The motor keeps pace with the control handle, and even an untrained operator does not require to spend a long time in getting the "feel" of it.

SALES REPRESENTATIVE

The Edwin H. Fitler Co. of Philadelphia have appointed George B. Hausen, Inc. sales representatives in California. George B. Hausen has offices in the Hobart Building, San Francisco, and in the Great Republic Life Building, Los Angeles.

The Edwin H. Fitler Co. are manufacturers of Fitler rope and cordage for every marine use, as well as for all industrial uses. The company will specialize in California in selling their product for marine and oil well supplies. Stocks will be carried at Wilmington and Taft.

SAN FRANCISCO
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Gasoline-Proof Packing

SOME weeks ago the tanker Paul Shoup of the Associated Oil Company's fleet was badly damaged by fire and explosion. The repairs were made at the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., San Francisco, and the vessel at the same time was refitted to carry gasoline instead of crude oil. This necessitated remaking of all joints on pipes, hatches, manholes, as well as all expansion joints of cargo pipes and valve stems.

Garlock Packing Company's No. 681 gaskets were used on all joints, and a special wax treated flax packing, made by the same firm, was used in the moving stems of the valves and expansion joint glands. This material is impervious to gasoline and does not harden when it comes in contact with that fluid. The installation was supervised by John Hepburn, who secured the order for the Garlock firm.

After the repairs had been finished, the cargo tanks were cleaned and washed by the Martin Ship Service Company. Then a cargo of gasoline was taken south and discharged at San Pedro, so that every vestige of dirt in the tanks would be eliminated. After that another cargo of gasoline was loaded and sent foreign.

This shows what pains are taken to insure absolute purity of the California gasoline when finally delivered to customers. The first lot of gasoline taken out of the Paul Shoup at San Pedro was very clean, proving good work had been done at San Francisco by the Martin ship cleaning service. However, as rolling about at sea tends to wash dirt out of all parts of the holds and cargo pipes, it is customary to refine and clean all first cargoes of gasoline.

Powell Valves

HIGH pressure steam presents a problem in metallurgy and design to the manufacturer of valves. In the days of 60 pounds boiler pressure, almost any old brass would stand up. As pressures began to mount up to 225 pounds and higher, with superheated steam, common brass seats and valve disks would cut out in short time and especially so if the steam was throttled down as it passed through the valve.

Among the first to make really good valves was The Wm. Powell Co. of Cincinnati. They were the originators of the noted White Star valves with renewable seats and disks. With this construction it was little trouble to make a new valve out of an old one at small cost and without dismantling the body of the valve from its position.

Modern research and metallurgy have given much time and effort to the blending of alloys which would hold up under severe usage. The results of this work have been put into use in the Powell shops and high-grade valves are being made that are suitable for modern high pressure steam plants. Thus Powell keeps pace with the advances in marine engineering practice.

The writer well remembers some thirty years ago putting on a Powell White Star valve where trouble was had with the ordinary type. This valve was used as the throttle for the steam reverse gear, and prior to the installation of the Powell type leak troubles were constant. When the Powell was installed the bother was ended, and after twelve years it was still functioning. How much longer it lasted is not known, as the steamer was sold foreign.

Some Recent Union Installations

Some of the diesel engine installations recently reported by the Union Gas Engine Company of Oakland, California, include the following:

A 75-horsepower Union diesel will be installed in a towboat by the Standard Dredging Company of Galveston, Texas.

The old trading schooner Hermes, which is well known in Pacific ports, is being equipped with a 150-horsepower Union diesel engine. The installation is being made in Honolulu.

A new schooner is being built by Anderson & Cristofani, Hunter's Point, San Francisco, for Rocholl, Ruffo & Company of Mexico. Her power plant will consist of a 110-horsepower Union diesel engine.

The Campbell Machine Company of San Diego are building another large fishing boat, which will be equipped with a 225-horsepower direct reversible Union engine of the same type as that installed in the U. S. Bureau of Fisheries boat Brant, which at the present time is making her headquarters in southern waters.

A 75-horsepower Union diesel was shipped on the steamer Sinaloa, to be installed in a towboat in one of the Mexican ports.

The Bay Development Company of San Francisco has converted the power plant of the Fox. Her new engine is a 110-horsepower Union diesel of the same type as that installed in the William Fisher, which is owned by the same company.

The French Government has installed a 75-horsepower Union diesel in the Mouette, a cruising schooner used in the South Seas.

The new steel tanker Associates, built by Bethlehem, San Francisco, for the Associated Oil Company, is now in commission. She is equipped with two 110-horsepower 3-cylinder Union diesel engines.

Washington-Estep Progress

THE Washington Iron Works, Seattle, report much work in their diesel department and that the shop is operating at nearly full capacity. Busy on the 600-horsepower, 6-cylinder, directly reversible, geared diesel for the conversion of the Golden Gate Ferry Company's ferryboat Golden City, and on a number of smaller units, they received word recently that the Puget Sound Navigation Company had ordered two 375-horsepower, 6-cylinder, directly reversible Washington-Estep diesels of a design and type very similar to the 270-horsepower unit recently installed in the Seattle tugboat Sound.

Clifford Brown, superintendent engineer of the Golden Gate Ferry Company of San Francisco, has recently returned from a visit to the Seattle plant of the Washington Iron Works, where he inspected the new 600-horsepower Washington-Estep engine now under construction for the conversion of the steamer Golden City. This job is of a very special character, including a bedplate designed to fit the peculiar conditions of the hull and the propeller shafting of the steamer. This bedplate houses two clutches and two sets of herringbone gearing. Mr. Brown expressed himself as well satisfied with the progress of the work and as greatly admiring the completeness and efficiency of the shop equipment and practice at the Seattle plant.

The 600-horsepower unit for the Golden City is now being erected on the test block at the shop and will soon be undergoing shop tests. It will be the largest single diesel unit operating in a San Francisco Bay ferryboat.

Sales Representative Appointed

The Bridgeport Brass Company announces the appointment of Hale J. Denny as salesman of the Bridgeport line of tubular plumbing supplies, Bridgeport-Keating flush valves, and Plumrite brass pipe in the Chicago office territory, which comprises ten Middle Western states.

Mr. Denny, who will work under the direction of R. M. Hubler, Chicago district manager for the Bridgeport Brass Company, has been identified with the plumbing specialty game for about five years, soliciting orders for plumbing goods of all kinds from jobbers and manufacturers in Chicago and adjacent territory.

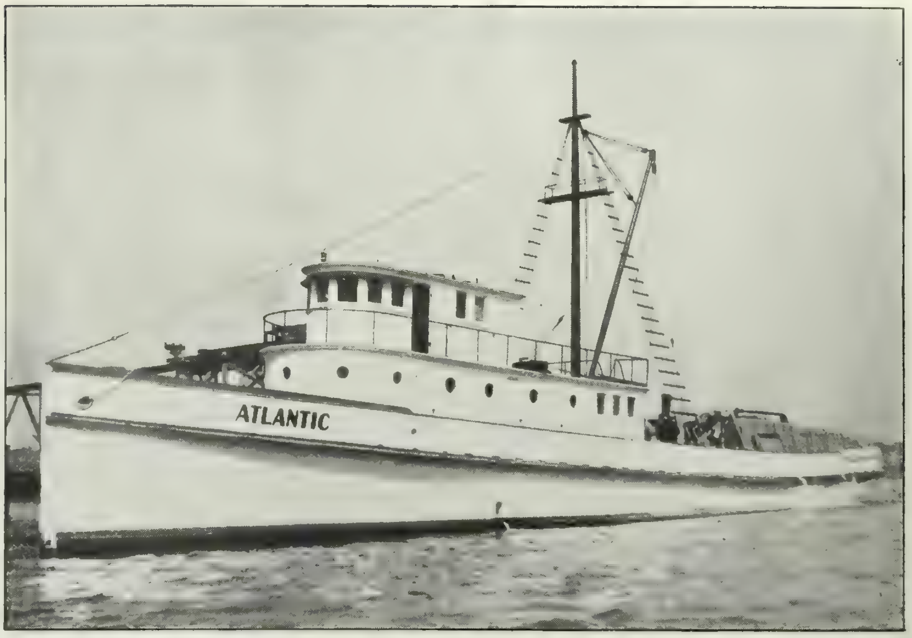
LARGEST FISHING BOAT

As far as we know, the Atlantic is the largest fishing boat on the Pacific Coast. It is 110 feet long, with a beam of 25 feet and a draft of 7 feet 6 inches. She was designed by M. Madruga and built by the Campbell Machine Company of San Diego for M. O. Medina and J. V. Soares.

Some very large timbers were used in the construction of this vessel. The keel was made from a piece 14x16 inches and 104 feet long, the keelson 18x18 inches and 91 feet long, the engine timbers 14x14 inches and 60 feet long, all of Oregon pine. Stem, stern post, and frames are of oak in sizes ranging from 14x16 inches to 8x8 inches, and the planking of hull and deck is Oregon pine, 3 inches thick.

The boat is equipped with a 300-horsepower 6-cylnder Union diesel engine and with a 7-horsepower Union gas engine for auxiliary power.

Her cruising radius is about 4000 miles at full speed. Her auxiliary equipment consists of a refrigerating plant, electric light plant, power winches, and pumps for circulating clean sea water through live bait tanks. Accommodations are provided for two officers and eight men.



Colo Diesel Reports Sales

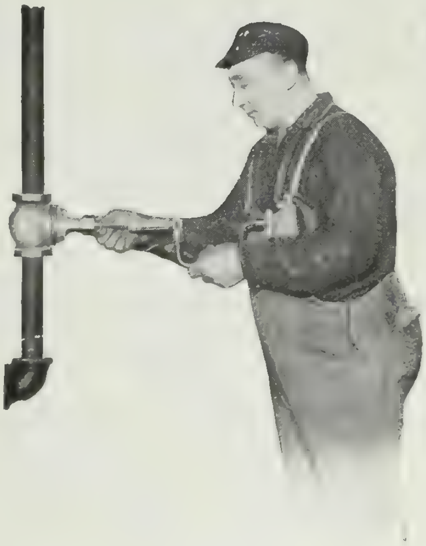
THE Colo diesel engine was developed in Europe shortly after the war, but it was not until eight or nine months ago that this engine was marketed on a commercial basis in this country. Since that time several of these engines have been sold to American ship owners. The Golden Gate Ferry Company have ordered three of the 4 cylinder size engines to be used as generating sets in their three new ferry boats. They have also purchased one 1-cylinder and one 2-cylinder engine to be used for generator drive aboard their ferry Golden City, which is now being converted from a steamer to a geared drive diesel motorship.

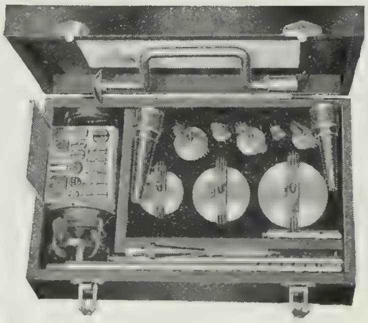
The Colo diesel engine has a bore of 5 inches and a stroke of 7 inches, and is built in units from one to six cylinders. As the parts are interchangeable it requires very few spare parts to keep these engines properly equipped. The marine type engines are built equipped with either the clutch and gear reverse or the reversible propeller, and all sizes are started from cold by a hand crank without the use of any compressed air or electric starter. This greatly simplifies the installation.

A Colo diesel of the 2-cylinder size is soon to be placed in a fishing vessel at San Pedro, as well as another 3-cylinder unit in a pleasure boat. There will also be installed on the Sacramento River a 3-cylinder Colo diesel engine for driving a fishing boat. On Puget Sound and the Columbia River much interest is being taken in these units, and an engine is to be installed in Seattle within the next 60 days.

The sole distribution rights for this engine for the United States are held by F. Van Rossen Hoogendyk, international authority on diesel engines, with offices in New York and San Francisco. The sales for the San Francisco Bay district are further handled by E. V. Winter of San Francisco and those for Puget Sound by J. O. Larsen, 19 Colman Dock, Seattle. Engines will be carried in stock on both coasts and spares and service will be available in all leading seaports.

A Handy Valve Tool





We illustrate herewith the box set which composes the Skinner Valve reseating tool as supplied to many marine power plants and, at the left, the manner in which this tool is used in reseating valves without disconnecting the valve body from the pipe line. These tools are distributed in San Francisco by the McGee Sales Agency.

SPERRY OPENS PERMANENT OFFICE IN CLEVELAND

In order to be better able to care for its rapidly growing business on the Great Lakes, the Sperry Gyroscope Company has opened an office and display room in the Rockefeller Building, Cleveland, according to an announcement recently made by Charles S. Doran, president of the Sperry company.

According to Mr. Doran, many of the new and interesting developments of the company will be placed on exhibit at these quarters, where they may be inspected by officials and officers of the local steamship companies. It will also be of interest to steamship officials and officers to learn that the Sperry company is planning to operate a school in Cleveland this winter as they have done for the past three years.

Mr. J. A. Tison, who has been representing the Company in the Great Lakes district for the past four years, will be in charge of the new office.

Marine Insurance

Edited by JAMES A. QUINBY

The Abuse of General Average

An Address Delivered Before the Study Class of the Association of Marine Underwriters of San Francisco by M. C. Harrison, November 15, 1926

[Note: The Pacific Marine Review in no way advocates the reforms mentioned herein. The article is printed as an able exposition of a little-known side of a difficult subject by a man who for twenty years has been America's chief opponent to the extension of General Average.]

THE origin of general average, as you know, is lost in antiquity. It was probably introduced by the Phoenicans from 1100 to 1400 B. C. through the traders of Sidon and Tyre, members of a tribe then and forever after known as the leaders in mercantile affairs. The beginning of such trade dates from Genesis 10-18, and it is not only possible but probable that the Jettison mentioned by the apostle Paul in one of his voyages was settled by a general average. The first definite and concrete chronicle of general average law is found in the Pandects of Justinian, written by the Byzantine emperor in the early part of the sixth century, in which he refers to the laws of the Rhodians who were at the zenith of their sea trade during the 3rd and 4th centuries B. C.

The underlying principle admits of no argument nor criticism as to its sound justice and has stood the test of all the ages, and all the experience, education, and thought have produced nothing more righteous. This piece of wisdom from the ancients is a strong argument against evolution upward in the mind of man.

It is quite certain that the early traders built vessels, assembled and loaded their wares, and embarked with their goods and co-adventurers on trading expeditions, each and all travelling with their goods and returning with other wares taken in exchange. When disaster threatened, a consultation was held and a sacrifice decided upon; and soon the weight of advice of the sailing master became the deciding voice because of his experience. Immediately thereafter or at the end of the voyage which then was only a matter of a few days, voyages being short, a settlement was made. All principals being on the spot and all joining in, there was no adjuster, no fee, no commissions, no letters, telegrams, or printing and no interest. A few sheets probably of parchment sufficed if indeed any record was made. It is likely settlement was made by handing over parts of the saved goods and it is possible, if not probable, that the trader's interest in the vessel was somewhat the same as his interest in the goods.

This thought prompted my plan of abolishing general average.

Ancient Principle Unchanged

I might say much more about the maritime peoples who have led successively in sea ventures such as the Early Italians, and of the Spanish and English, but it serves no useful purpose. The general average principle has not not changed one iota. Conditions of trade have changed, voyages have become longer, ships larger, motive power has improved and changed, magnitude and variety of cargoes have increased, buying, selling, and consignments have undergone a great evolution and general average adjusters have had serious moments in deciding how to fit the principle to the case. However, they are not to be criticized for lack of fertile ideas. The development of correspondence and means of communication, money, banking, and bills of exchange practically stopped the exchange of goods and the settlement of general average thereby, and at each step a new expense or charge has been added. Merchants generally gave up owner-

Them Damaged Cargo Blues

(To be sung to the tune of "Old Hundred" or "Sweet Adeline," depending on how far the banquet has progressed.)

SCENE ONE

(One? I've seen lots of 'em.)

As the curtain rises, the Cargo Owner is discovered downstage left, mournfully contemplating a pile of damaged merchandise. The Steamship Claims Agent rows up to the footlights in a leaky skiff. He carries a sheaf of form letters and begins to note a protest against heavy weather, singing happily as he works.

CLAIMS AGENT:

I.

It is much to be regretted
That your goods are slightly wetted
But our lack of liability is plain,
For our latest bill of lading
Which is proof against evading
Bears exceptions for sea water, rust, and rain,
Also sweat, contamination,
Fire, and all depreciation
That we've ever seen or heard of on a ship.
And our due examination
Which we made at destination
Shows your cargo much improved by the trip.

II.

Furthermore, the protest shows
That the master blew his nose
And the hatches were demolished by the gale.
Oh, we'll all stick together
To prove it's heavy weather
For we've got the cargo owner by the tail.
So, reserving all defenses
Alibis and false pretenses,
We suggest that your underwriter man
Is the guy that's out of luck.
We always pass the buck
Yes—we always duck the issue if we can.

J. A. Q.

Arthur M. Brown **EDWARD BROWN & SONS** *Arthur M. Brown, Jr.*

MARINE DEPARTMENT—*Harry W. Browne, Manager*

PACIFIC COAST GENERAL AGENTS

THE GLOBE & RUTGERS FIRE INSURANCE CO., INC.

200 BUSH STREET, SAN FRANCISCO

FIREMAN'S FUND
Insures Hulls, Cargoes,
HEAD OFFICE: CALIFORNIA and SANSOME

JOSEPH HADLEY,
European Agent
3 LOTHBURY, E. C.
LONDON

E. A. VALENTINE, Resident Agent for Oregon
714-715 BOARD OF TRADE BUILDING
PORTLAND, ORE.

FRANK G. TAYLOR, MANAGER, PACIFIC NORTHWEST BRANCH

ship of vessels and vessel owners gave up interest in goods and gradually a gap came between them and their interests separated. Merchants now know but little about general average and practically everyone, merchant and shipowner, has come to rely on his underwriter. The large ships, large and assorted cargoes to which I refer, the long voyages, each and all go to produce a diversity of insurance and location of underwriting, so great as to make united action in the present day next to impossible.

And so there has crept into this very equitable law, by and through the evolution of trade, ships, cargoes and customs, a most iniquitous control of the adjustment and settlement; and it is from this fact that our chief objection comes.

Custom Becomes Right

The original deciding voice of the master soon grew into a right, and by custom, when an adjuster was apparently needed, carried with it the appointment. Then when owners gradually ceased sailing their own vessels, the appointing authority rested with the managing owner. Nearly everywhere in the world except where governments take a hand in settlements, the ship owner has the sole and uncontrolled right to appoint the adjuster.

The traditional attitude of an adjuster is that of an impartial expert of semi-judicial character who is expected to apply the law and customs correctly. Wm. R. Coe, in his treatise of 1912, says:

"Usually, in this country, the shipowner regards the adjuster as his adviser in practically all matters connected with the accident."

That statement tells a voluminous story on its face as well as between the lines. Everyone knows the ship's interest in making a settlement has just one antagonist; viz., the cargo owner. Now if the ship's adviser is named as the adjuster what becomes of the cargo owner's interest? All he can do is to pay the demands or hand it over to his lawyer, which cannot sensibly be done because the differences are usually less than the sure cost of the lawyer, not to mention annoyance, loss of time, and possibility of losing the case. So the cargo owner being insured says to his underwriter, "It's your matter in the end. Please pay me or settle with the ship, then do as you please with the question."

Underwriter's Position

This brings us to the underwriter's position and so far as the financial result he may have no other similar interest on the ship, so to him the result would be the same as to the shipowner. But there are other things that deter the underwriter even if he finds the probable financial result will warrant his fight. If any one party in commercial transactions is more detested than another, it is a litigious underwriter. Furthermore if litigation starts, not only the shipowner but the adjuster commences to divert business from that underwriter; and when it is remembered that in this country practically every adjuster is not only the shipowner's insurance broker but is usually one of the largest brokers in the field, it will be seen what a powerful weapon is placed in the hands of the shipowner and his "adviser." For these reasons the underwriter, right or wrong, usually pays. And so on such question as may be at issue another precedent is established.

During my own day several things have started and they are now referred to as justification for a continuous practice.

I call to your attention that if the shipowner does any sort of work, makes a trip even to look after his ship's interest, sends out circular letters, sends a telegram, he is given an allowance in the average.

Thirty years ago the adjuster ascertained all values, negotiated with cargo owners all sacrifices to cargo, drew the adjustment in his own office, and received simply his fee, which was moderate. He did not even get the collecting commission.

Now he prepares circular letters and has them charged; he employs special appraisers who handle all damaged goods. if owners do not stoutly object, and pays and charges sums out of proportion for men of their ability and charges it in the adjustment; he employs printers at very extraordinary rates and charges it in the adjustment; and one unversed might readily inquire if there is any advantage for the shipowner or his "adviser" in these large charges which are under his sole control.

Suggested Remedy

I find that twelve years ago when I wrote my brochure on the abolishment of general average I stated the cost of adjustment to be from 15 to 25 per cent. I now find that from a compilation of 146 cases, which work I carefully compiled last year, the percentage was 33.7 per cent, from which the steady growth can be seen. The end cannot be far away.

I have to suggest three methods as being possible remedies:

First: Abolish general average and establish the community of interest as I have heretofore proposed.

Second: By force of a combination of underwriters at the large ports of the country force the shipowners to consult with the underwriters and appoint no adjuster until they can all agree thereto.

Third: Appeal to the various state legislatures or to Congress to pass a law making the adjuster either a state or national officer under salary.

By the last method we can any way emancipate ourselves from the continuous enormity of expense and if graft should creep in we would still retain the power to change the official.

Gourlie, our most extensive authority on general average, says:

"The law connects vessel and cargo on a quasi-copartnership, operating to involve the one in the fate of the other, so long as the partnership object, viz., the performance of the voyage, be capable of life and prosecution." 391, and,

"The law and practice in the United States upon the theory of mutual benefit assumes a confraternity of interests in the nature of a partnership as existing between the ship, freight and cargo, from the time of shipment until the discharge." 21, and,

"The whole principle of general average is based on the effort to place the different interests of the adventure in

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STREETS, SAN FRANCISCO, CALIFORNIA

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CHARLES R. PAGE, Manager
ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

309 COLMAN BUILDING, SEATTLE, WASHINGTON

the same relative position that they occupied before the intervention of the sacrifice (equality of danger, equality of safety, equality of cost.)" 28.

Such principles will, if carried to their logical end, cause each party at interest to make the same sacrifice in money, time, and labor as the others and will require, if there are any savings or emoluments or compensation of any kind, that they all share alike therein.

But by a careful analysis it will be seen that the finish of the partnership venture is not settled that way. For instance, the ship owner is allowed a commission on his payments of 2½ per cent if he has voyage freights in hand and a commission of 5 per cent if he has to advance the money, and is allowed a commission of 5 per cent and 2½ per cent for collecting when the average has been adjusted. These payments are not competitive and nowadays are more than twice the amount that would be charged by financial institutions for similar service.

Then again the shipowner is allowed all his expenses of every nature, for his circular letters, telegrams, trips, hotel bills, and even in some cases his employes' salaries, in the adjustment, while the cargo owners, collectively at least, have more work and outlay of this kind and get nothing whatever. Therefore we may say that the partnership operates fully in obligation but not in the way of opportunity for recoupment of expense and trouble and for actual profit.

The shipowners and cargo owners are now only the nominal partners. The latter gives time and labor and gets no compensation while the former holds to all his perquisites and gets paid for everything, most times far too much. It must have occurred to you that at the time hull insurances are being solicited there is real competition, and you may have often been astonished to see with what ease the brokerage firm which has an adjusting department walks away with the business regardless of the ability and standing of the brokerage firms not so equipped. I do not need to suggest the reason.

In closing I will only remark that the real partners, so far as general average is concerned, are now practically entirely underwriters and they are likely to suffer handicaps I have mentioned until the shipowner is shorn of the entire control I have mentioned. They can apply a remedy if they will.

A Pool on Small Hulls

AMERICAN underwriters have been growing more and more reluctant to take chances in the hull business. In fact, some of them have intimated that anyone who wrote a hull policy was taking chances. Several Pacific Coast agencies have received polite but firm instructions from New York to discontinue the business altogether. Figures showing that Pacific Coast hulls have been profitable risks for the past five years have been, in some instances, insufficient to alter such instructions.

The underwriters themselves allege that changing conditions are responsible for this depreciation in the face value of all but the cream of the hull risks. They point to the passing of the old type of seamanship, with its skilled and careful mariners, and shake dubious heads at commercialized corporations who operate their ships for profit rather than love. And they view with alarm the rise of more delicate propelling machinery. At the mere mention of a latent defect, marine managers cower behind their desks and loss men reach for their technical defenses.

The small boat risks—barges, halibut boats, cannery tenders, and the like—have come in for more than their share of criticism. The underwriter is prone to overlook certain precautions which are never omitted in case of larger vessels. The small size, the moral hazard incident to a "single-boat" owner, the trade, and many other elements of each separate risk, should be carefully examined before a rate is set.

J. V. Bunbury, underwriter for the Royal Insurance Company, in a recent address on the subject before the study class of the Association of Marine Underwriters of San Francisco, expressed the opinion that this type of business could be profitably written if each and every risk were carefully scrutinized. Mr. Bunbury also went on record as favoring the formation of a pool for small hulls, which should pro-rate premiums and maintain a permanent staff of competent surveyors.

The pool system has been suggested before, in this and other connections. As with any form of cooperative endeavor, the chief difficulty has to do with keeping the members in line. A loosely formed pool, organized merely to stabilize rates, would probably fail. Most of us are only human, and some of us are not even paid-up members of that group. The protective organizations of intercoastal carriers have found that members have a deplorable tendency to kick up their heels and bolt from the pasture whenever some new business is sighted. The same tendency may be expected in a hull pool the only function of which is to protect the rate. A nice juicy fleet of boats would be offered, and the pool and its rates would go to smash.

There is another and more efficient type of pool which, we believe, could be utilized to good advantage in the small hull field on the Pacific Coast. Such an organization would demand two main features.

The first of these would be, of course, a central surveying staff, to which all risks would be submitted. These risks would thus be graded impartially and their rates of premium scientifically estimated.

The second feature would consist of an independent bureau, or managing agency, whose duty would be to distribute the risks upon some prearranged schedule, so that each individual policy would operate to spread the new business automatically. There would still be the temptation to pick off the cream of the business and write it independently, but any act of this sort could be quickly detected, and suitable steps taken to penalize it.

Such an organization is at least worth a trial, since it offers a possibility of improving conditions at the source, and thus writing small hull risks at a profit.

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INSURANCE
BROKERS FOR THE ASSURED—AVERAGE ADJUSTERS

Freights, Charters, Sales

December 22,1926.

INTERCOASTAL Lumber: There is some demand for foreign tonnage for British Columbia loading to North of Hatteras ports and charterers are indicating $14.50, possibly $15, for suitable tonnage, January loading.

Australian Lumber: There is quite a demand for tonnage in this direction and charterers' ideas are $14, two ports loading to two ports discharging, Brisbane/Port Pirie range.

Japan-China: The rates obtainable for Japan lumber range between $10 and $11, according to port or ports of destination. Shanghai charterers quote $11.50 for lumber, $4.75 for wheat.

U.K.-Continent Grain: A very limited amount of tonnage is offering for wheat and/or barley to U. K.-Continent. Some large steamers have been offering firm for January/February loading at 40/- without success. Charterers have lately secured tonnage for December loading at between 42/6 and 45/-. One steamer is offering for December 20/January 20 at 43/9, while charterers' ideas are 40/-. For January/February, charterers now indicate 35/-.

The following steamers are reported fixed with grain to the United Kingdom/Continent: Br. str. Eastmoor, 45/-, Dec.; Am. str. West Katan, Dec., Kerr Gifford & Co.; Jap. str. (Suzuki) 45/-, option Puget Sound or Columbia River loading 46/3, Nov./Dec.; Br. str. Indian City, 45/-, Dec.; Jap. str. Meigen Maru, Dec., Canadian Cooperative Wheat Producers; Jap. str. Yone Maru, Dec., Dreyfus & Co.; Br. str. British Monarch, relet, middle Dec.; Jap. str. Kifuki Maru, 40/-, prompt; Jap. str., 40/-, Dec.; Br. str. Innerton, 40/-, Jan./Feb., Canadian Cooperative Wheat Producers, Ltd.; Jap. str., 41/9, Dec./Jan.; Jap. str. Kinkasan Maru, 40/-, option Columbia River 41/3, Dec./Jan., Kerr Gifford & Co.; Nor. str., 40/-, option Columbia River 41/3, Jan.; Ger. str. Sachsenwald, 42/6, option British Columbia, 41/3, Jan., Kerr Gifford & Co.; Jap. str. Taiho Maru, 42/9, option British Columbia 41/6, Dec., L. Dreyfus & Co.; two steamers, 42/6, option British Columbia 41/3, Dec./January, Wilmer Grain Co.; Br. str. Welsh City, 40/9, option Puget Sound or Columbia River, 1/3 extra, Jan.; Br. str. Holms Light, 40/-, Jan. Strauss & Co.; Jap. str., 41/3, option Portland or Puget Sound, 42/6, December, Balfour Guthrie & Co.

For grain to the Orient the following fixtures are reported: Jap. str Goshu Maru, Shanghai, $4.75, Jan.; Jap. str Ryujin Maru, same; Jap. str. Taiyu Maru, Japan, $4.75, Jan.; Jap. str. Yoman Maru, Shanghai, Dec./Jan., Mitsubishi.

A Japanese str. is reported fixed from the North Pacific to Australia, lumber, Dec. loading, by Canadian Transport Co.

The following fixtures are reported for lumber to the Orient: Am. str. Bert E. Haney to Colon; Jap. str. Hayo Maru, Japan, lump sum, Dec., Canadian American Shipping Co.; Jap. str. Yomei Maru, two ports Japan, $11, Nov., Canadian Transport Co.; Jap. str. (K Line), Shanghai, $11.75, Nov./Dec., Pacific Export Lumber Co.; Am. str. Brunswick, Japan, Dec.; Jap. str., Japan, Dec.; Jap. str., Japan, $10 prompt; Jap. str. Yomei Maru, 3 ports Japan (relet), Dec., Douglas Fir Exploitation & Export Co.; Br. str. Canadian Ranger, Japan, Jan., Canadian Transport Co.; Jap. str. Kohnan Maru, Shanghai, $10, Dec./Jan., Canadian Trading Co.; Jap. str. Milan Maru, Japan, Dec., Nakagawa & Co.; Jap. str. Tenpaison Maru (or sub.), Japan, $9.50, Jan./Feb., H. R. MacMillan.

The American str. West Cactus is reported fixed from Willapa Harbor to Rosario, Nov./Dec. loading, Douglas Fir Exploitation & Export Co., and the American str. S. A. Perkins, from San Francisco, Eureka, Columbia River, and Puget Sound to Salaverry and Callao, Jan., Balfour Guthrie & Co.

The following steamers are reported fixed with lumber to the Atlantic Coast: Am, str. Edna Christenson, British Columbia to New York, $15, Nov./Dec., W. L. Comyn & Co.; Am. str. J. R. Gordon, North Pacific to North of Hatteras, Dec.; Am. str. Onondaga, Puget Sound to North of Hatteras, Dec., Charles R. McCormick Lumber Co.

The American m.s. Carriso is reported fixed from San Francisco to Australia with case oil, prompt loading.

The following steamers are reported fixed on time charter: Jap. str. Hokuyo Maru, Pacific trade, 4 months, Yen 1.45, Dec., Suzuki & Co.; Jap. str. Shingo Maru, same, 6 months, Yen 1.65, Yamashita Co.; Jap. str. Shinyo Maru, same; Jap. str. Tateishei Maru, same, 6 months, Yen 1.70, Dec., Yamashita Co.; Jap. str. Ryui Maru, same, Yen 1.40, Nov., same charterers; Jap. str. Asaka Maru, same, Yen 1.70, Nov., Mitsui & Co.; Jap. str. Fuku Maru, same, 3 months, Yen 1.65, Nov. Mitsui & Co.; Jap. str. Unyo Maru, same, 6 months, Yen 1.80, November, Ocean Transport Co.; Jap. str. Aida Maru, 6 months, Yen 1.80, Dec., same

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Norwich Union Fire Ins. Society, Ltd.
British & Federal Fire Underwriters
PACIFIC COAST
BRANCH
(Marine Department)
114 SANSOME STREET
Phone Douglas 6313

charterers; Jap. str. Kurohime Maru, same, Yen 1.95, late Nov., Mitsui & Co.; Jap str. Tomi Maru, 4 months, Yen 1.75, late Nov., Suzuki & Co.; Jap. str. Heiyei Maru, 12 months, Yen 2, Dec., Yamashita Co.

The following sales are reported: American strs. Eastern Admiral, Eastern Light, and Eastern Mariner (to be renamed Willboro, Willkens, and Willzipo, $175,000 each, United States Shipping Board to Merchant Marine Steamship Corporation, to be operated by Williams Steamship Company; American str. Panama, Panama Railroad Company to Alaska Steamship Company; American str. Brooklyn, Sudden and Christenson to S. L. Whipple; American str. Brunswick, purchased by Japanese parties, delivery Japan, Mar.; American tank str. Kekaskee, $393,575, United States Shipping Board to Richfield Oil Company of California.

PAGE BROTHERS, Brokers.

Book Review

The annual report of **Colonel E. Lester Jones, Director of the United States Coast and Geodetic Survey,** shows important advances made in hydrographic and geodetic surveys in the far western states and on the Pacific Coast, as well as many other accomplishments of value to the people of this section of the United States.

On the Pacific Coast, a survey of Newport Bay was completed. Soundings were obtained in San Pedro Channel, in the large area south of Santa Cruz and Santa Rosa Islands, California, and off the coast of Oregon from Port Orford south. A reconnaissance was made of the inshore area near Cape Blanco.

Surveys of the coasts of Oregon and Washington in the vicinity of the Columbia river were begun. Two separate surveys were made of the channels across Willapa Bar. A survey of the shore line along the Strait of Juan de Fuca west of Point Wilson was completed. Field examination of the Pacific Coast for pilot information was made.

A special investigation was made of the waterfront of San Francisco, also of the South Channel and Bonita Channel of the San Francisco Bay entrance. These channels were swept with a wire drag to locate a reported danger to mariners and to determine the least depth in the vicinity of Centissima Rock. A wire-drag survey of Greenwood Landing, California, was in progress at the close of the fiscal year.

It is of interest that a determination of the old longitude stations at Seattle, by means of radio time signals, differs only 0.003 second of time from the value obtained for that station by the old method of longitude determinations where telegraph lines were used to transmit the time signals between observatories. This close agreement is a source of great satisfaction, declares Colonel Jones, who says it indicates clearly that the longitude determinations by means of the radio signals have a very high degree of accuracy.

The report shows that six primary tide stations, for purposes of tide observations, were maintained on the Pacific Coast during the year. These were located at San Diego, La Jolla, Los Angeles, San Francisco, Astoria, and Seattle. For a short period, a portable automatic tide gauge was maintained on the open coast at San Francisco, at the Lurline pumping station, to obtain a comparison of tide conditions on the open coast with those at the primary tide station at the Presidio inside the Golden Gate.

During the year, new editions of Part I and Part II of the Alaska Coast Pilot were prepared, as well as new editions of the California, Oregon, and Washington Coast Pilot, for the use of mariners. Two publications of special interest to the Pacific Coast were issued, "Tides and Currents in San Francisco Bay" and "Coastal Currents Along the Pacific Coast." The latter publication describes in detail the tidal, non-tidal, and wind-driven currents at each of the five light vessels on the Pacific Coast.

Colonel Jones, in his report, stresses several important needs of the Coast and Geodetic Survey at this time. Among other things, he says:

"For years there has been emphasized the need on the Pacific Coast for seaworthy launches or tenders of approximately 60 feet in length to work in conjunction with the large ships and to do that work for which the ship is too large and too expensive and for which boats carried on the ships' davits are too small. The need is urgent for three such tenders.

"The two ships now surveying on the coasts of Washington and Oregon are operating with hired launches which are poorly suited to the work. There are many times and places, however, where it is impossible to hire a launch. Then it becomes necessary to carry on the work with the small boats while the ship stands by. Although the cost of leasing launches is greater than to own and operate them, the consideration of unit cost of the work demands that this expensive practice of leasing launches continue until necessary tenders are provided."

Another pressing need, according to Colonel Jones, is for additional personnel and equipment to properly handle the greatly increased demand for charts, which is the greatest measure of the Coast Survey's service to the public. He states that, during the year, the total issue of charts was 232,286, representing an increase of about 30 per cent over 1925 in the number of charts purchased by the general public.

Trade Literature

Cameron Centrifugal Pumps is the title of Bulletin Form 7059 recently issued by **Ingersoll-Rand Company,** 11 Broadway, New York.

The bulletin covers the Cameron single - stage, double - suction, volute pump in three classes, LV, FV, and HV, and each class is very clearly described and illustrated. Cameron pumps have, through years of experience in their manufacture, been highly developed, of rugged construction, and designed strictly in accordance with modern engineering theory and practice. Simplicity in design and minimum number of working parts, together with provisions for easy access to interior members, are added features which have been highly developed and are embodied in all Cameron pumps. All parts, with the exception of the impeller, which is especially designed to meet each particular case, are manufactured on a quantity basis. This allows shipment of repair parts immediately upon receipt of order—a point which will be fully appreciated by every pump user.

The bulletin, in addition to detailed description, illustrates a great variety of applications of Cameron pumps, and a copy of the bulletin may be had by applying to the Ingersoll-Rand Company, 11 Broadway, New York, or to any of their branches.

The Cleveland Crane & Engineering Co., Wickliffe, Ohio, through their Cleveland Electric Tramrail division, have issued an interesting leaflet on their Cleveland Tramrail Systems for the handling of materials, products, and parts in factories.

Paving the Way for Alloy Steels is the title of a handsome booklet issued by The International Nickel Company, 67 Wall Street, New York. They describe this booklet as "A message to makers of steel—to manufacturers whose products embody steel." The booklet is a plea to these two classes of industrial executives to engage in a greater campaign for the development and research of steel and to spread a wider knowledge of the advantages of using alloy steel, in the hope that all producers and users of alloy steel will benefit in this campaign. It is a most interesting booklet and one which should interest the Makers and Users of Steel, to whom it is directed.

Silent Gears is descriptive catalog GEA-482 issued by the General Electric Company, Schenectady, New York, covering two classes of gears, fabroil and textolite. The catalog points out in its introduction the need, in most modern industrial plants, for the introduction of machinery or parts which will reduce noise of operation and also that will do away with the necessity for constant maintenance charges and renewals due to increase in the volume of production. The catalog further points out the part played by Fabroil and Textolite gears in bringing about these desired results.

The manufacture and installation of the two types of gear are described in great detail and clearly illustrated with half-tone engravings. Complete tables of sizes are also given.

The Sterling Engine Co., Buffalo, New York, has issued an unusually attractive booklet on the subject of their Sterling Dolphin engine of four and six cylinders. The booklet contains many photographs of the Dolphin engine in several sizes, with complete description of each; also attractively arranged photographs of motorboats and yachts powered with the Dolphin engines.

The Westinghouse Balanced Motor Handbook has been issued by the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania. The purpose of this little book (which is of 15 pages and a handy pocket size) is to explain in nontechnical language what the factors are that enter into a motor design and how these factors influence the cost of installation, cost of operation, amount of production, and cost of maintenance. A knowledge of these facts should be of considerable value and interest to the user of electric motors, and the booklet may be obtained on request from the above address.

Tycos Instruments for Steam Power Plants, issued by the Taylor Instrument Companies, is one of the most compact and conveniently made up catalogs which we have received. Particularly we note an Application Index, which is intended to simplify the selection of the proper instruments for a specific application. This index gives the various steps in regular sequence, and under each step is listed the individual process, with the instruments best adapted to that specific application.

The Tycos instruments listed and described in this catalog comprise a most complete line for use in steam power plants. They are the selection of instruments from the many thousands manufactured by the Taylor Instrument Companies of those found to best meet the requirements of the various applications.

A copy of this catalog may be obtained free of charge from the Pacific Coast service station of the company at 86 Third Street, San Francisco.

Drip Proof Ventilated Type SK Marine Motors are described in **Westinghouse Electric & Maufacturing Co.** Leaflet L. 20252.

This motor is manufactured primarily for marine use to meet a demand for an accessible, inexpensive unit. It is direct current, with constant and adjustable speeds, shunt, compound, and series wound, 115, 230 and 550 volts. The type SK motor affords absolute protection of electrical parts from the moisture and dripping water often encountered in underdeck service.

Power Plant and Oil Refinery Equipment. This is a catalog recently received from the **E. A. Key Company,** 1301 Santa Fe Avenue, Los Angeles, Pacific Coast representatives of the Key Boiler Equipment Company.

The catalog covers in compact and complete form the many boiler equipment parts and supplies manufactured and sold by this firm, together with complete price-list of all sizes and descriptions of their line.

Among the leaflets recently received from the **General Electric Company,** Schenectady, New York, and which will be sent free of charge to any interested party are those covering the following equipment:

Automatic Arc Welding Apparatus—Welding Head and Accessories, fully described and illustrated in a 12-page folder, together with photographs of actual applications.

Automatic Arc Welding Apparatus—Semi-Automatic Welder, described in a single page leaflet.

Induction Motor-Generator Sets, 1 to 35 kilowatt, 125 or 250 volts, recommended for general service and for excitation of synchronous motors; described in a leaflet.

Constant-Speed, Direct-Current Vertical motors, Types BD and CD, shunt or compound wound, 115, 230, or 550 volts; described in a leaflet.

Foote Bros. Gear & Machine Company, Chicago, have issued their Catalog No. 200 covering **Gear Problems and IXL Speed Reducers.**

This catalog is of handy size, of 621 pages, containing description and sizes of "industrial gears for every purpose." The catalog also contains complete index and price-list of all gears and parts.

Bartlett Hayward Company, Baltimore, Maryland, has issued a folder on Fast's Flexible Coupling, which may be obtained by addressing the company at Scott and McHenry Streets, Baltimore.

Fulton Iron Works Company, St. Louis, Missouri, have issued a catalog, or bulletin, on the Fulton Diesel Engine. This is a 4-cycle, air-injection, engine of 300 to 2000 horsepower. The bulletin contains 27 pages and covers in detail the particulars of practical applications of this engine, complete description of the parts and their design and an exposition of Fulton service.

The Diamond and Industry is the most recent addition to the somewhat limited information on the industrial diamond and its many uses. This booklet published by the **Wheel Trueing Tool Co.** of Detroit has been written primarily as an aid to the executive responsible for industrial costs and production where diamonds and diamond tools are in use.

The application of the diamond to industrial processes has been growing steadily for a number of years. The result, today, of this movement is reflected in an improvement of the manufactured article and a reduction of manufacturing costs. This phase of the subject follows an introduction describing the diamond deposits and the South African mines. The selection of diamonds, the care of diamonds, and the function of the diamond expert in his relation to industrial problems, is fully discussed. Especial attention is devoted to the use of diamonds as a means of trueing the abrasive wheel for accurate grinding.

A copy of this booklet will be forwarded to industrial executives on application.

The Panama Mail Steamship Company recently issued a travel folder entitled **Spanish Americas.** This folder has a very attractive cover in colors showing a Panama Mail liner offshore on a tropical coast and depicts within its pages, in very attractive manner, the many colorful and interesting scenes in ports of call on its San Francisco and Los Angeles to New York service through the Panama Canal.

The credit for this attractive folder goes to William A. Young, Jr., general passenger agent, who is now on a tour of the Eastern agencies of his company.

Registers of Revenue, a publication dealing with the description of the advantages of the design of Watthour Meters, has just been issued by the Westinghouse Electric and Manufacturing Company. The permanent accuracy of the Watthour meter, low costs of adjustments and tests, low cost of handling, ease in reading and saving of storage space are some of the points covered in this unusual circular, C-1753.

This publication may be obtained from any of the District offices of the Westinghouse company or from the publicity department at East Pittsburgh, Pennsylvania.

GENERAL ELECTRIC APPOINTMENT

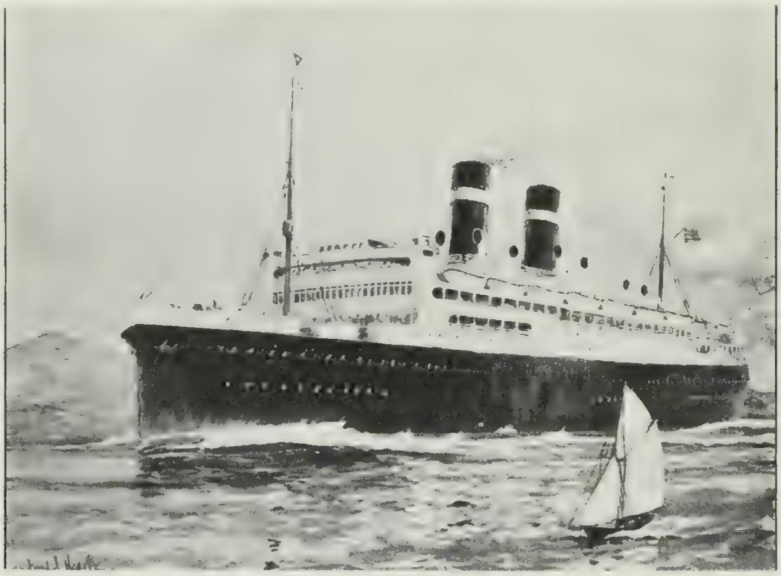
Burton L. Delack, assistant manager of the Erie, Pennsylvania, works of the General Electric Company, has been appointed assistant manager of the Schenectady works, effective December 1, 1926. At the same time John St. Lawrence, general superintendent at Erie, has been named to succeed Mr. Delack there.

American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Progress on Steamship California



Panama Pacific Line Steamship California.

Framing of the Panama Pacific liner California, the largest American-built steamship, has been completed at the yard of the Newport News Ship Building and Dry Dock Company, where the last bow stations and the stem have been put into place.

Plating of the big vessel already has progressed well up to the waterline. The stern frame is in place, and the work of placing the huge castings that support the outboard bearings of the twin propellers is now in hand for erection. These castings weigh 37 tons each. Each supports the outboard end of a shaft 192 feet long, weighing 365,000 pounds and having a diameter at the point of passing through the outboard bearing of 21 6/16 inches. Each of the two propellers weighs 39,000 pounds and is 18 feet in diameter with three blades.

Work of building into the hull the tanks for fresh water and for oil fuel is practically completed. The water tanks have a capacity of 2100 tons, and the fuel tanks 5100 tons. The provision for oil supply will permit the ship to make the round voyage of more than 11,000 miles between her fuel base in California an New York without refueling.

The ship's turbo-electric propelling machinery is also coming along on schedule, the great reduction gears for the turbines have been completed. The electric driving machinery, manufactured by the General Electric Company at its Schenectady plant, is expected to be finished shortly.

The ship's boilers, condensers, and other structural units are taking shape as fast as the hull. The condensers represent a job of which the staff at the works is proud, as they are the largest yet installed in a commercial vessel built in the United States. The two main condensers weigh 80,000 pounds each and two auxiliary condensers 20,000 pounds each. With the water which they will contain, the four condensers in service will weigh 240,000 pounds.

In another shop work is going forward on the ship's two stacks, which will rise 134 feet above the keel and 102 feet above the waterline.

Although work as heavy as that on the California has never before been done on an American-built liner, there has been no delay in connection with any of the various parts of the ship, and the builders report the job as a whole exactly on schedule, with the date of launching set for July and delivery for October, 1927.

Steamer Yarmouth Launched at Cramp's

The Yarmouth, a palatial ocean-going passenger steamer for Atlantic service between the United States and Canada, was launched at the Cramp shipyard, Philadelphia, November 6. This is the first of two identical vessels being built for the Eastern Steamship Company. The vessel was named for the port in Nova Scotia to which most of her cruises will be made. The sponsor was Miss Elizabeth S. Downs, sister of one of the directors of the Eastern Steamship Company. The Yarmouth will be delivered the latter part of January. Her sister ship, to be named Evangeline, will be launched in about two months, delivery being scheduled for next April.

The vessels, which will be turbine driven, measure 377 feet 3 inches in length, 55-foot molded beam, and 18 feet molded draft. They are of the

USE WYBROCK INDIANA BENDING OAK

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three-deck superstructure type, also having a continuous promenade deck and a boat deck, making five decks in all. There are four hatch openings with electric freight elevators through the main and lower decks.

The propelling machinery will consist of single reduction geared turbines driving twin screws, steam being supplied by six single-ended Scotch boilers fitted for burning oil fuel. Each vessel is to be equipped with all necessary auxiliaries, electric lighting, and power plant, cold storage system for steward's storage boxes and for chilled freight space, electric elevators, steam capstans, steam windlass, steam and auxiliary steering gear, mechanical ventilating system, heating system, complete ballast and drainage system, telegraph, telephone, and call systems.

The superstructure, including a part of the upper hall 'tween decks, will contain first class passenger accommodations. Each ship will be equipped to carry a total of 734 passengers. The furnishings and appointments will be on a lavish scale. Particular attention is being given to the cargo space with a view to carrying automobiles.

Second Turbo-Electric Freighter for Bradley Transportation Company

Following the success of the steamship T. W. Robinson, the Bradley Transportation Company of Rogers City, Michigan, has decided to put in service another boat of the same type. The T. W. Robinson, the only boat of its kind in the world, went into service in July 1925 and has been operating successfully since that time. It embodies the first application of turbine-electric drive to a bulk freighter.

On the T. W. Robinson, with a 317-pound working pressure, 225 degrees Fahrenheit superheat, Foster water-tube steam generator installation using mechanical stoker coal firing, Foster Economizers, and Foster Radiant Heat Superheaters, there was also installed turbine-electric drive with a motor direct connected to the propeller shaft. All maneuvering is done from a simple control stand located alongside the main turbine generator. Electrification has been carried out almost entirely for the engine room auxiliaries, deck auxiliaries, and galley equipment.

The second boat will be much larger. It will be built by the American Ship Building Company, Cleveland, and will be used in the same service—transporting limestone from the plant of the Michigan Limestone & Chemical Company to various ports on the Great Lakes. Turbine-electric drive will be used, similar to that on the T. W. Robinson, but of greater horsepower. There will also be a more complete electrification of the auxiliaries. The General Electric Company, who supplied the generating, propulsion, and the majority of the auxiliary electrical equipment on the T. W. Robinson, will also furnish the power plant, propulsion motor, and electrical auxiliary equipment for the new boat.

Turbo-electric drive Great Lakes ore carrier T. W. Robinson, of the Bradley Transportation Co.

Three Shipping Board Tankers Sold

The United States Shipping Board has sold three of its nine tankers in the laid-up fleet for the aggregate sum of $849,000.

The sale of the tankers, Kehuku, Romulus, and Dannedaike for steam operation under the American flag was approved by the Shipping Board on December 14. The sale was approved on the basis of a second group of bids received for the remaining tankers held by the Board in the laid-up fleet. Two of the vessels were sold after receipt of the first group of bids and it has been decided that the remaining vessels, six in all will not again be advertised for sale.

The sales approved were as follows:

Kehuku, to the Chile Steamship Company, Inc., of New York, for the sum of $323,000.

Romulus, to A. I. Kaplan, of New York, for the sum of $316,000.

Dannedaike, to the American Tankers Corporation, of Boston, for the sum of $210,000.

All other bids received were rejected.

The bid of the Richfield Oil Company of $393,575 for the Kekoskee, and that of James C. Brady of $304,--152 for the Darford were accepted on the first call for bids.

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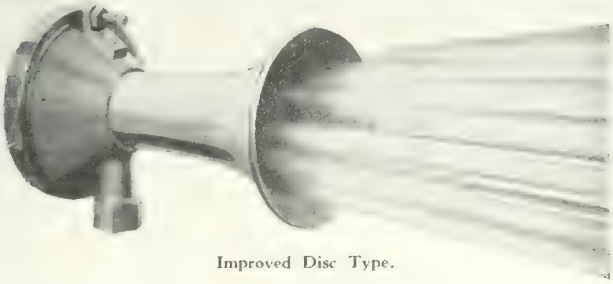

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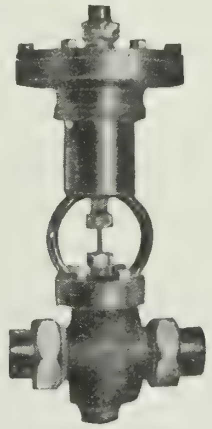
For Marine Pumps



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Recent Shipbuilding Contracts

TODD SHIPYARDS CORPORATION TO CONVERT FREIGHTERS

The Robins Dry Dock & Repair Co., Erie Basin, Brooklyn, New York, one of the plants of the Todd Shipyards Corporation, has been awarded an important conversion contract. Reports from New York inform us that the Standard Transportation Company, owners of the freighters Eagle and Tiger, will have these vessels converted to oil tankers at a cost of about $500,000. The conversion is being made to meet the serious tanker shortage. Some changes will also be made in the propelling machinery. The freighters have been recently operated by the Williams Line in intercoastal service. They were built at the Union Iron Works, San Francisco, and are sister ships of 6274 gross tons each.

ORDER PLACED FOR SEATTLE FERRYBOAT

The Winslow Marine Railway & Shipbuilding Co., Seattle, has been awarded contract for the construction of an automobile and passenger ferryboat for the Puget Sound Navigation Company, to be operated between Edmonds and Port Ludlow. The vessel will be 160 feet over-all, 52 feet beam, and 13 feet 6 inches depth. The propulsion power will consist of two 375-horsepower, 6-cylinder, directly reversible Washington Estep diesel engines, giving the ferryboat a speed of 14 miles an hour. The engines are to be built by the Washington Iron Works, Seattle. The ferryboat will have a carrying capacity of 60 automobiles and about 500 passengers.

Charleston Dry Dock & Machinery Company, Charleston, S. C., has an order for a dredge for the Gulf Refining Company, to be 95 ft. long, 30 ft. beam, and 8 ft. depth. They have also laid keel for a 65-foot towboat.

Howard Shipyards & Dock Company, Jeffersonville, Ind., has an order from the Tri-State Ferry Co., Cairo, Ill., for a diesel propelled ferryboat. The boat will be 100 ft. between perpendiculars, 30 ft. beam, and 5 feet deep. She will have a speed of 9 miles and will be powered with a 180 horsepower 6-cylinder diesel engine.

Great Lakes Engineering Works, Detroit, Mich., has an order for a bulk freighter for the Pittsburgh Steamship Co., of Cleveland, Ohio. The vessel will be 580 ft. between perpendiculars, 60 ft. beam, and 20 ft. loaded draft. She will be powered with 2200 indicated horsepower triple expansion engines; steam to be supplied by three Scotch boilers, 14 ft. diameter by 11 ft. 6 in. Delivery is scheduled for May 30, 1927.

Sun Shipbuilding Company, Chester, Penn., has several new orders. One of these is for two twin screw motor tank barges for the Gulf Refining Co., to be 136 ft. long, 27 ft. beam, and 11 ft. 6 in. depth. They will be powered with 400 brake horsepower engines, and will have a cargo capacity of 385 tons on 9-ft. draft and speed of 9 miles.

This company has an order for a twin screw motor tank barge for the Tidewater Oil Company, to be 252 ft. long, 40 ft. beam, and 14 ft. depth, to carry 1885 tons on 12 ft. draft and 10 miles speed.

The fourth new job for this yard is a single screw bulk oil steamer to be 480 ft. long, 65 ft. 9 in. beam, and 32 ft. depth, with a carrying capacity of 13,000 tons on 27 ft. 6 in. draft. The vessel will have a speed of 13 knots and engines will develop 4350 indicated horsepower.

Toledo Shipbuilding Co., Toledo, Ohio, has an order for a car ferry for the Wabash Railway Co. This ferry will be 388 ft. long, 57 ft. 6 in. beam, and 16 ft. loaded draft. She will have a speed of 13½ miles loaded and deadweight tonnage of 2500. The ferry will be powered with triple expansion steam engines developing 2500 indicated horsepower; steam to be supplied by four Scotch boilers of 14 ft. 6 in. diameter.

This yard also has an order from the Pittsburgh Steamship Company for a freighter, to be 580 ft. long, 60 ft. beam, and 19 ft. loaded draft. Loaded speed will be 12½ miles and deadweight tonnage 12,500. This job will also be powered by triple expansion steam engines developing 2500 indi-

WM. CORNFOOT, President GEO. RODGERS, Sec'y-Treas.

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cated horsepower; steam to be supplied by three Scotch boilers of 14 ft. diameter.

Los Angeles Shipbuilding & Drydock Corp., San Pedro, Calif., has an order from Julian Petroleum Corporation of Los Angeles for a steel tow barge for oil deliveries. The barge will be 131 ft. long, 40 ft. beam, and 11 ft. 6 in. draft.

G. F. Matthews, Portland, Ore., wooden boat builder, has an order for a ferryboat to cost about $60,000 for operation between Astoria and Megler. The boat will be powered with a diesel engine, although the type has not yet been determined.

Hoffar Marine Construction Co. and Beeching Ltd., Vancouver, B.C., have an order from the British Columbia Public Works Department, Vancouver, for a ferryboat 95 ft. over-all, 33 ft. 3 in. breadth, 8 ft. 7 in. depth, to be powered with 120 horsepower Fairbanks-Morse diesel engines. The boat will have capacity for 16 automobiles and their passengers.

American Brown Boveri Electric Corp., Camden, N.J., has an order from the Reading Company for six carfloats, two to be of 10 cars capacity and four to be of 8 cars capacity. Keels will be laid this winter.

American Bridge Company, Pittsburgh, has an order from T. Smith & Son, Inc., of New Orleans, for one derrick boat hull 100 by 50 by 10 ft.

Prince Rupert Dry Dock & Shipyards, Prince Rupert, B.C., has an order for a 75-ft. tugboat from the Granby Consolidated Mining, Smelting & Power Co.

William Muller, Wilmington, California, has an order from the Wilmington Transportation Co. for two barges to cost about $40,000 each.

KEEL LAYINGS

Stockton and Fresno, ferryboats for Southern Pacific Company, San Francisco, by Bethlehem Shipbuilding Corp., Union Plant, Nov. 8 and 20.

Two ferryboats for Southern Pacific Company, San Francisco, by The Moore Dry Dock Co., Oakland, Dec. 8.

Towboat hull for Hillman Trans. Co. by American Bridge Co., Nov. 20.

Six steel motor patrol boats for U.S. Coast Guard by American Brown Boveri Electric Corp., Camden, N. J., during Nov.; also two barges for Reading Co., during Oct.

Governor Carr, ferryboat for Jamestown-Newport Ferry Co. by Bethlehem Shipbuilding Corp., Fore River Plant, Quincy, Mass., Oct. 11.

Oil barge for Seaboard Shipping Corp. by Bethlehem Shipbuilding Corp., Harlan Plant, Wilmington, Del., Oct. 12.

Dredge for Gulf Refining Co. by Charleston Dry Dock & Machinery Co., Oct. 11; towboat Nov. 17.

Comoco, steel yacht for R. W. Judson, Detroit, by Defoe Boat & Motor Works, Dec. 15.

Steel guide dock for E. T. Slider, New Albany, Ind., by Howard Shipyards & Dock Co., Nov. 16.

Barge for Southern Cotton Oil Co. by Midland Barge Co., Midland, Pa., Nov. 15; two barges for Inland Waterways Corp.

Caracas, passenger and freight steamer for Red D Line by Newport News Shipbuilding Co., Nov. 18.

Car ferry for Wabash Railway Co. by Toledo Shipbuilding Co. Nov.

LAUNCHINGS

Six steel motor patrol boats for U. S. Coast Guard by American Brown Boveri Electric Corp. during November.

Yarmouth, twin screw passenger and freight steamer for Eastern Steamship Lines by Wm. Cramp & Sons Ship & Engine Building Co., Nov. 6.

Two Barges for Inland Waterways Corp. by Midland Barge Co., Midland, Pa., during Nov.

Meitowax, tugboat for Long Island Railroad Co., by Staten Island Shipbuilding Co., Nov. 27.

Steel barge for W. C. Kelly Barge Line by Charles Ward Engineering Works, Oct. 25.

Steel automobile ferryboat for D. T. Williams, Richmond, by Howard Shipyards & Dock Co., Nov. 30.

DELIVERIES

Five coal barges to Wheeling Steel Corp. by American Bridge Co., Nov. 11.

Charles W. Culkin and Governor Moore, two diesel-electric vehicular ferryboat for Electric Ferries, Inc., New York, by Brown Boveri Electric Corp., during Nov.; also two barges for Venezuela Gulf Oil Co., during Nov.

Daniel A. McCormack, ferryboat for City of Boston by Bethlehem Shipbuilding Corp., Oct. 21.

No. 21 carfloat for Long Island Railroad by Bethlehem Shipbuilding Corp., Harlan Plant, Nov. 6; also carfloat for So. Ry. Co., Nov. 15.

Three steel carfloats for Pennsylvania Railroad by Wm. Cramp & Sons Ship & Engine Building Co., Oct. 21, Nov. 13, and Nov. 26.

Dredge for New Orleans firm by Nashville Bridge Co., Nov. 24.

Sansome, steel hull towboat for G. F. Pettinos, Philadelphia, by Spedden Shipbuilding Co., Oct. 29.

REPAIRS

The Moore Dry Dock Company, Oakland, California, has received a contract from the California and Eastern Steamship Company of Los Angeles for reconditioning of the steamer

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Successors to
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SHIP REPAIRS OF ALL KINDS

Manufacturers of

"Kibele Straight Line Boiler Feed Water Controls"

"Tobin Commercial Gas Burners"

"Kibele Automatic Steam Atomizing Oil Burners"

Berth 94 San Pedro, Calif.

West Mingo, recently purchased from the Shipping Board. The work will cost in the neighborhood of $70,000.

Bethlehem Shipbuilding & Drydock Corp., at East San Pedro, Calif., has a contract from the Chile Exploration Company for extensive repairs to the tanker Chuky, which grounded at Arica recently. The bid for the repair of thirty plates and repairs to tanker's rudder and shaft was $49,158 and 18 days. The Moore Dry Dock Company also submitted a bid—for $52,776 and 22 days.

Shipbuilding Work in Prospect

WILMINGTON TRANSPORTATION COMPANY MAY ORDER ANOTHER TUGBOAT

It is reported that an order for another tugboat will be placed with William Muller of Wilmington, California, by the Wilmington Transportation Company. This company put into service during 1926 two powerful tugboats powered with Winton diesel engines and Westinghouse generators and motors, developing 450 shaft horsepower, the motors being directly connected to propeller shaft. These tugs had a length of 90 feet and were of wooden construction. A third tug, the Louie Black, is now under construction.

FUNDS ARE REQUESTED FOR RIVER TOWBOAT

The War Department has included in its budget a request for $2,000,000 for the development of the Inland Waterways Corporation. A part of this fund, if granted, will be used for the purchase of a towboat, also 24 barges now under lease.

PLANS FOR SCOUT CRUISERS COMPLETED

Plans for three more of the light cruisers authorized by an appropriation act of May 21, 1926, have been completed and mailed to the yards for the preparation of bids for their construction. Contract for the construction of a similar cruiser, the Salt Lake City, was placed with Wm. Cramp & Sons Ship & Engine Building Co. last year, as well as the propelling machinery for the Pensacola, building at the New York Navy Yard.

BIDS OPENED FOR FERRYBOAT

The Quartermaster's Department of the Army at Governor's Island, New York, opened bids in December for a steel ferryboat. Bids were submitted by the Southern Shipyard Corporation, the American Brown Boveri Electric Corporation, Federal Shipbuilding & Drydock Company, and the Chas. Ward Engineering Works. A number of proposals were submitted by each company covering different types of machinery, including steam engine and Scotch boiler power, steam-electric, direct diesel, and diesel-electric. Prices ranged from $223,000 to $395,000. Some time will probably be required to analyze the bids and decide on the type of propulsion power to be employed.

TOWBOATS FOR ARMY ENGINEERS

The United States Army Engineers Office, at St. Louis, Missouri, has asked for bids to be submitted up to January 20, 1927, for one diesel-electric towboat. The boat is to be 131 feet 5/8 inch over-all, 23 feet molded breadth, 3 feet 6 inches loaded draft. One diesel engine of 300 brake horsepower is to be connected to a generator of 185 kilowatts at 230 volts. The propelling motor is to be of open type, reversible, shunt wound, and capable of delivering 225 horsepower. Ward-Leonard system of pilot house control will be employed.

Bids will be opened at the office of the U. S. Army Engineers at Mobile, Alabama, on February 7, 1927 for a diesel-electric tugboat similar to the one mentioned above. This tug will have power plant consisting of two 250 horsepower diesel-electric generator sets developing power for a 400 horsepower propelling motor.

OVERHAUL JOB

Reports from Seattle state that bids for overhauling and repairing the United States Coast Guard cutter Algonquin will be issued soon. The Algonquin is now in Astoria.

The Harkins Transportation Company, foot of Adler Street, Portland, Oregon, will shortly call for bids for the construction of an express passenger vessel to transport passengers between Astoria and Portland. The vessel will be 185 feet long, 32 feet beam, and 10 feet depth. She will be equipped with twin screws and powered with either direct diesel or diesel-electric drive. The plans call for a speed of about 16 knots, although it was the original intention of the company to build a vessel operating at over 20 knots speed.

The County Commissioners of Multnomah County, Oregon, are planning the construction of a new ferry at St. Johns, and have included an appropriation of $87,393 in their budget for this purpose. Portland is the county seat of Multnomah County.

The Colonial Navigation Company, Pier 39, North River, New York, is planning the construction of two passenger steamers for coastwise trade between New York and Providence. Plans and specifications will be ready in January.

Bids for the construction of machinery for the three Coast Guard Cutters Nos. 45, 46 and 47, will be called soon. The cutters will be of the same type as the Tampa, Mojave, and Haida, built in Oakland, Calif., in 1921, except that they are to be direct current turbo-electric drive instead of alternating current. Specifications are under the supervision of the Commandant, U. S. Coast Guard, Washington, D. C.

J. C. Rohlfs, manager of the Marine Department of the Standard Oil Company (Calif.), with office in San Francisco, will have charge of the conversion of the tank steamer District of Columbia to diesel-electric drive. Specifications are now being prepared for the work.

Contract has not yet been awarded for the diesel engines to be installed in the ferryboat now under construction at the yard of G. F. Matthews, Portland, Oregon.

No particulars have been received concerning plans for three fireboats for the city of Portland, Oregon, for which $300,000 was recently voted by the community.

Progress of Construction

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT

Potrero Works, San Francisco

Purchasing Agent: O W Streett.

Stockton, hull 5331, double-end diesel-electric vehicular ferryboat for Southern Pacific Co., San Francisco; 256' L.O.A.; 44'10" beam; 19' depth; four Nelseco diesel engines. 450 H.P. each; **keel Nov. 8/26.**

Fresno, hull 5332, sister to above; **keel Nov. 20/26.**

Tahoe, hull 5333, sister to above.

GENERAL ENGINEERING & DRYDOCK CO.,

Alameda, California

Purchasing Agent: Geo. Armes.

Not named, hull 3, diesel-electric wooden auto ferry for Golden Gate Ferry Co.; 240' L.B.P.; 44' beam; 11' 6" loaded draft; 13 knots speed; 3-400 B H P. Ingersoll-Rand diesel engines, direct connected to Westinghouse generators; keel Oct 28/26.

Not named, hull 4, sister to above.

Not named, hull 5, sister to above

Not named, hull 6, diesel-electric, steel automobile ferryboat for Southern Pacific Co.; 236' L.B.P.; 44' 10" beam; 12' 6" loaded draft; 13 knots speed; 4-450 B.H.P. Nelseco diesel engs. connected to General Electric generators; keel Oct. 28/26.

J. C. JOHNSON'S SHIPYARD

Port Blakely, Wn.

Reed No. 3, hull 83, scow for Reed Mill Co., Shelton Wn; 95'x33'x8'5".

Reed No. 4, same as above.

Reed No. 5, same as above.

LAKE WASHINGTON SHIPYARDS.

Houghton, Wash.

Purchasing Agent: A. R. Van Sant.

Cruiser for Stewart Edward White, 58 feet L.B.P.; 55 H.P. Washington-Estep diesel eng.; keel Oct. 11/26.

Five scows, 60 ft. long, keels Oct. 11/26

THE MOORE DRY DOCK COMPANY

Oakland, California.

Purchasing Agent, Nat Levy.

Peralta, hull 170, double-ended, screw propelled ferryboat for Key System Transit Co.; 256 L.B.P.; 47 molded beam; 21 molded depth; 14.5 normal speed; turbo-electric propulsion; water-tube boilers; keel May 3/26, launched Oct 14/26, deliver Jan. 30/27 est.

Yerba Buena, hull 171, sister to above, keel May 3/26; launched Nov. 22/26; deliver Feb 15/27 est.

Not named, hull 172, diesel-electric, steel, vehicular ferryboat for Southern Pacific Company, 236' L B P; 44'10" beam 12'6" loaded draft; 13 knots speed, 1250 S H P Nelseco diesel engs., connected

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent: R. S. Page.

Gulfpride, hull 86, tanker for Gulf Refining Co.; 525' L.B.P.; 74' beam; 28' loaded draft; 11 knots speed; 17,400 D.W.T.; 4500 I.H.P. diesel engs.; keel June 15/26.

No name, hull 89, passenger and freight steamer for Southern Pacific Steamship Lines, Pier 49, North River, New York; 427 L.B.P.; 60 beam; 25'6" loaded draft; 6700 D.W.T.; De Laval steam turbines; 7700 S.H.P.; 4 B. & W. boilers, 21,900 sq. ft. heating surface; 16,000 sq. ft. superheating surface; keel Jan. 20/27 est.

GREAT LAKES ENGINEERING WORKS
River Rouge, Mich.

Purchasing Agent: Chas. Short.

Not named, hull 255, bulk freighter for Pittsburgh Steamship Co., Cleveland; 580 L.B.P.; 60 beam! 20 loaded draft; T.E. engs.; 2200 I.H.P.; 3 Scotch boilers 12' diam. by 11'6"; deliver May 30/27 est.

HOWARD SHIPYARDS & DOCK COMPANY
Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

No name, hull 1590, diesel-electric side-wheel excursion boat for stock; 250x40x7 ft.; 15 mi. speed; 2-400 H.P. 6-cyl. diesel engs.

Patricia Barrett, hull 1592, steam towboat for Barrett Line, Cincinnati; 125' L.B.P.; 40' beam; 6' deep; 4' loaded draft: comp. engs. 18"x32"x6'; 4 Scotch boilers, 44"x22'; keel June 23/26; launched Sept. 21/26; deliver Dec. 8/26 est.

Hull 1593, steel hull for stmr. Mississippi of Mississippi River Com., St. Louis, Mo.; keel Sept. 25/26; launch and deliver Dec. 15/26 est.

Hull 1596, concrete mixer hull for Mississippi River Commission, St. Louis, Mo.; 120 L.B.P.; 45 beam; 7' depth; keel Oct. 21/26; launch Jan. 5/27 est.; deliver Jan. 7/27 est.

Hull 1597, steel guide dock for E. T. Slider, New Albany, Ind.; 120'x24'x4'; **keel Nov. 16/26.**

Hull 1598, same as above.

Hull 1599, same as above.

Hull 1600, same as above.

Hull 1601, hull for Baton Rouge Car Terminal, Baton Rouge, La.; 285'x60'x9'6"; keel Jan 20/27 est.

Hull 1602, steel automobile ferryboat for D. T. Williams, Richmond, Ky.; 93'x20'x2'6"; **keel Oct. 27/26; launched Nov. 30/26;** deliver Dec. 10/26 est.

Not named, hull No. 1603, diesel ferryboat for Tri-State Ferry Co., Cairo, Ill.; 100 L.B.P.; 30' beam; 5' depth; 9 mi. loaded speed; 125 D.W.T.; 6-cyl. diesel eng.; 180 I.H.P.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Purchasing Agent: H. Meyer.

Hull 226, one car ferry for Grand Trunk Milwaukee Car Ferry Co.; 360' L.O.A.; 58' molded beam; 21'6" depth; 2 T.E. engs.; 4 Scotch boilers; launched Oct. 23/26.

Hull 227, car ferry, sister to above; keel July 1/26; launch Jan. 15/27 est.; deliver Mar. 1/27 est.

MARIETTA MANUFACTURING COMPANY
Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Thirty steel discharge pontoons for U.S. Army Engineers, Rock Island, Ill.; 38'x14'x3'2".

One steel stern-wheel towboat for Magdalena River, Colombia; 125'x26'x5'; tandem compound engs.

Twelve steel hoppered cargo barges for Magdalena River, Colombia; 125'x26'x6'; keel Dec. 17/26 est.

MIDLAND BARGE COMPANY
Midland, Pa.

Purchasing Agent: H. S. Neal.

One barge for Southern Cotton Oil Co., 100x35x7 ft.; **keel Nov. 15/26;** launch Dec. 10/26 est.

Fifteen barges for Inland Waterways Corporation, 126'x33'x7'6"; 6 keels laid; **2 launched.**

Steel sand and gravel dredge hull for E. T. Slider, New Albany, Ind.; 175'x50'x6"; keel Mar. 1/27 est.

MIDLAND SHIPBUILDING COMPANY, LTD.
Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

Not named, hull 18, package freighter for Canada Steamships, Ltd.; 230 L.O.A.; 38 beam; 23 depth; T.E. engs.; keel Oct. 11/26; deliver Apr. 15/27 est.

Not named, hull 19, package freighter same as keel Oct. 11/26; deliver Apr. 15/27 est.

NASHVILLE BRIDGE COMPANY
Nashville, Tenn.

Purchasing Agent: Leo E. Wege.

Hull 107, dredge for a New Orleans firm; 124 L.B.P.; 30' beam; 8' draft; 15" suction dredge with cutter; [illegible] diesel machy.; keel Aug. [illegible]/26; **launched Nov. 8/26; delivered Nov. 24/26.**

Hull 108, dredge for same firm; clam shell bucket type; [illegible]; keel Jan. 1/27 est.

Hull 111, deck barge for stock; 100 L.B.P.; 24 beam; 5 loaded draft; keel Oct. 18/26; launch Nov. 20/26 est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas: Plummer, 233 Broadway New York City.

Iroquois, hull 306, passenger and freight steamship for Clyde Steamship Company, New York, 407'-3" overall, 62'-0" beam, 30'-6" depth, Newport News turbines and gear; 8500 I.H.P.; Scotch boilers; oil burning; keel March 20/26; launch Dec. 11/26 est.

Shawnee, hull 307, sister to above; keel May 15/26; launch Jan./27 est.

California, hull 315, 18-knot, passenger liner for Panama Pacific Line, New York; 600 ft. long, 80 ft. beam, 52 ft. depth; watertube boilers for oil 22,000 gross tons; 17,000 I.H.P.; keel Mar. 20/26; launch Feb./27 est.

Algonquin, hull 317, passenger and freight steamship for Clyde Steamship Co., New York, 402'-0" overall, 55'-0" beam, 31'-6" depth; Newport News turbines and gears; Scotch boilers for oil burning; keel March 23/26; launched Sept. 9/26: deliver Dec./26 est.

Northland, hull 318, coast guard cutter for U. S. Government; 216' long; 39' beam; 24'9" draft; diesel-electric propulsion; McIntosh & Seymour engs.; keel Aug. 16/26; launch Dec. /26 est.

Caracas, hull 319, passenger and freight steamer for Red D Line, New York; 335'4" L.O.A.; 51' beam; 22' draft; Newport News turbines and gears; water-tube boilers; 3560 D.W.T.; 4000 S.H.P.; **keel Nov. 18/26.**

THE PUSEY & JONES CO.
Wilmington, Del.

Purchasing Agent: James Bradford.

Not named, hull 1031, single screw passenger freight steamer for Baltimore & Philadelphia Steamboat Co., Philadelphia; 219 L.B.P.; 45 beam; 11 loaded draft; 14½ mi speed; 4 crank, TE engs. 21-32-35-35 by 24"; two B & W water-tube boilers, 3046 sq. ft. heating surface each.

Not named, hull 1033, steel single screw day steamer for Hudson River Day Line, New York; 252 L.B.P.; 46 beam; 4-cycle, triple expansion engs.; 2800 I.H.P.; 4 B. & W. water-tube boilers; 11x12 200 lbs. pressure; keel Sept. 15/26; launch Jan. 15/27 est.

SPEDDEN SHIPBUILDING CO.,
Baltimore, Md.

Purchasing Agent: W. J. Collison.

Samson, hull 262, steel hull towboat, G. F. Pettinos, Philadelphia; 87' LOA x 21' beamx11'6" draft; 400 H.P. Ingersoll-Rand diesel engs.; keel March 15/26; launched Aug. 23/26; **delivered Oct. 29/26.**

STATEN ISLAND SHIPBUILDING COMPANY
Staten Island, N. Y.

Purchasing agent: R. C. Miller.

American Legion, hull 764, ferryboat for City of New York, 264 L.O.A.; 66 beam over-all, 47 beam mld.; 14 loaded draft; 15 mi. speed; abt. 2600 gro. tons; 2 comp. engines, 3500 I.H.P.; 4 W.T. boilers; keel Feb. 8/26; launched Sept. 29/26; deliver Jan. 15/27 est.

No. 33, hull 765, tugboat hull for New York Central R.R.; 96'x26'x10'-3"; 12 knots speed; 200 gr. tons; 650 I.H.P. diesel-electric prop. unit; keel Mar. 29/26; deliver Dec. 14/26, est.

No. 34, hull 766; tugboat, sister to above; keel Apr. 8/26; launched Oct. 15/26.

Meitowax, hull 768, tugboat for Long Island Railroad Co.; 108' L.O.A.; 26' beam; 13'2" molded depth; diesel-electric propulsion; keel June 16/26; **launched Nov. 27/26.**

Hull 769, grain elevator for International Elevating Co.; 130 L.O.A.; 35 beam; 9 loaded draft forward 11 loaded draft aft.; diesel engs.; keel Sept. 30/26; launch Jan./27 est.

Hull 771, steel caisson for Mid-Hudson Bridge.

Hull 772, steel caisson for Mid-Hudson Bridge.

Hull 773, wood caisson for Howland Hook; launched Sept. 18/26; **delivered Nov./26.**

SUN SHIPBUILDING COMPANY
Chester, Penn.

Purchasing Agent: H. W. Scott.

Hull 98, hydraulic dredge for American Dredging Co.; 110x31'10"x10'; keel Aug. 10/26; launch Dec. /26 est.

Hull 99, stern-wheel towboat for International Petroleum Co.; 160'x44'x5'; 3'3" draft; 750 I.H.P. engs.; keel Aug. 30/26; launch Nov. 19/26 est.; deliver Dec./26 est.

Hull 100, one oil barge for Proctor & Gamble, 150'x40'x13'; 1200 tons capacity; keel Oct. 4/26; launch Dec. [illegible] est.

Not named, hull [illegible], twin screw motor tank barge for Gulf Refining Co.; 136'x27'x11'6"; 400 B.H.P. [illegible]; to carry [illegible] tons on 9' draft, 9 mi. speed.

Not named, hull 101, sister to above.

Not named, hull 103, twin screw motor tank barge for Tidewater Oil Co.; 252' long; 40' beam; 14' depth, to carry 1885 tons on 12' draft, 10 mi. speed.

Not named, hull 104, single screw bulk oil steamer, owner not named; 480' long; 65' 9" beam; 37" depth, to carry 13,000 tons on 27'6" draft; speed 1½ knots; 4250 I.H.P.

TOLEDO SHIPBUILDING CO.
Toledo, Ohio.

Purchasing Agent: Otto Hall.

Not named, hull 177, car ferry for Wabash Ry. Co.; 388 L.B.P.; 57'6" beam; 16' loaded draft; 13½ mi. speed; 2800 D.W.T.; T.E. engs.; 2500 I.H.P.; 4 Scotch boilers, 14'6" diam.; **keel Nov. /26;** launch Jan. /27 est.; deliver Mar./27 est.

Not named, freighter, hull 178, for Pittsburgh Steamship Co.; 580 L.B.P.; 60' beam; 19' loaded draft; 12½ mi. speed; 12,500 D.W.T.; T.E. engs.; 2500 I.H.P.; 3 Scotch boilers, 14' diam,; keel Jan. /27 est.; launch May /27 est.; deliver July/27 est.

TODD ENGINEERING, DRYDOCK & REPAIR CORP.
Brooklyn, N. Y.

Purchasing Agent: H. J. Shannon.

Vidor, hull 39, steel twin-screw diesel motor yacht for S. P. Davis; 162' 10" L.B.P.; 27' 4" beam, 13' loaded draft, 14 mi. speed; 2 Bessemer diesel engs.; 800 S.H.P. ea.; keel March 25/26; launched May 25/26; deliver Nov. 15/26 est.

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Hull 50, steel barge for stock; 150x26x8ft.; keel July 27/26; launched Sept. 13/26.

Hull 51, steel barge for W. C. Kelly Barge Line; keel Aug. 24/26; **launched Oct. 25/26.**

Hull 55, same as above; keel Sept. 30/26.

Hull 54, same as above; **keel Sept. 29/26.**

Hull 55, same as above.

Hull 56, same as above.

Hull 57, same as above.

Hull 58, same as above.

Hull 59, same as above.

W. A. Shepard, hull 60, towboat for W. C. Kelly Barge Line; screw propeller, 2 Fairbanks-Morse diesel engs.; 720 B.H.P.; keel Sept. 23/26; launch Dec. 30/26 est.

Duncan Bruce, hull 61, stern-wheel towboat, for W. C. Kelly Barge Line; 135'x35'x6'; Fairbanks-Morse diesel engs.; keel Jan. 15/27 est; launch Feb. 28/27 est.

Repairs

GENERAL ENGINEERING AND DRY DOCK COMPANY
Alameda, Calif.

Drydock, clean, paint, misc. repairs: gas s. Alma, schr. Aneiura, Mahukona (also eng. repairs), m.s. Motormates, ferry Golden State (general repairs, remove and install propellers). Install oil burning system: stmrs. Corrales, Corsicana. Raise rudder, stack repairs, dry dock: bktn. Star of Chile. Renew bottom in hotwell: stmr. Stanwood. General repairs: stmr. Salatiga, ferry Golden West, stmr. Coquina, El Acuador. Engine and deck repairs: stmrs. Noyo, Montezuma. Renew shoe and misc. caulking: schr. Normandie. Misc. hull: stmr. Phyllis. Machy. and hull repairs: U.S.C.G. cutter Tamaroa.

COLLINGWOOD SHIPBUILDING CO.,
Collingwood, Ontario.

Purchasing Agent: E. Podmore.

Hull caulked, new ice plating, tail shaft drawn for examination, stern bearing relined, 26 ft. of new keel: stmr. Caribou.

CHARLESTON DRY DOCK AND MACHINERY CO.,
Charleston, S.C.

Misc. repairs: U.S.C.G. launch, yacht Edith, launch Frescellar, pilot boat J. T. Denham, launch Eca May, tugs Progress, Courier. General repairs: tug Hinton, fishing boat Glouster, barge Harlem, 2 lighters.

PRINCE RUPERT DRY DOCK AND SHIPYARD
Prince Rupert, B. C.

Docked, cleaned, painted, misc. carpenter work scow Griff. Docked, cleaned, painted, general overhaul stmr. Prince John. Fitted for grain loading stmr. Tofuku Maru. Pilot and deck house overhauled, chock rail supplied and fitted, general overhaul launch Lillian D. 10 fishing boats docked, cleaned, painted, misc. hull and engine repairs. 14 fishing boats repaired in hull and engine. 71 other commercial jobs.

VICTORIA MACHINERY DEPOT CO., VICTORIA, B. C.

Purchasing Agent: R. S. Hammill.

Removing oil storage tanks: stmr. Princess Ena. Winch repairs: stmr. Arna. Dock, clean, paint, propeller and hull repairs: stmr. Princess Maquinna, Canadian Freighter. Dock, clean, paint Harriett E. Boiler repairs tug Spray. Completion of extensive hull repairs Princess Patricia.

to Westinghouse generators. **keel Dec. 8/26.**

Not named, hull 173, sister to above; **keel Dec. 8/26.**

PRINCE RUPERT DRYDOCK AND SHIPYARDS

Prince Rupert, B.C.

One 75-foot tugboat for Granby Consolidated Mining, Smelting & Power Co.

W. F. STONE & SON

Oakland, Calif.

Purchasing Agent: Lester Stone.

No name, motor cruiser, for stock, 36x10x3½ ft.; 12 mi. speed; 65-HP. gas engines.

Not named, hull 823, passenger boat for Capt. Fred Lewis; 50' L.B.P.; 14 beam; 3' 6" loaded draft; 10 mi. speed; 50 I.H.P. gas eng.; deliver Oct. 1/26 est.

Not named, hull 824, yacht for John Borden; 140 L.B.P.; 30 beam; 14 loaded draft; 10 mi. speed; 360 I.H.P. diesel engs.; keel Sept. 1/26 est.; deliver May 1/27 est.

Not named, hull 828, yacht for Frank B. Drake; 55 L.B.P.; 13 beam; 6 loaded draft; 7 mi. speed; 30 I.H.P. gas eng.; keel Aug. 25/26 deliver May 1/27 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY

Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Two towboat hulls for Carnegie Steel Corp., Pittsburgh; 149' 2" x 33' 4"x5' 10-5/16".

Six barges covered for Carnegie Steel Co., 175x26x11 ft.; **3 delivered.**

Five coal barges for Wheeling Steel Corp.; 140'x26'x10'; **all delivered No. 11/26.**

Six barges for U. S. Engineers, St. Louis, 152x34x7 ft.

Five barges for Wheeling Steel Corp., 140x26x10 ft.

Fifteen barges for Carnegie Steel Co., 175x26x11 ft.

One towboat hull for Hillman Trans. Co.; 149' 2"x33'4"x5' 1 15-16"; **keel Nov. 20/26.**

One derrick boat hull for T. Smith & Son, Inc., New Orleans; 110'x50'x10'.

AMERICAN BROWN-BOVERI ELECTRIC CORP.

Camden, N. J.

Purchasing Agent: L. G. Buckwalter.

Hull 319, steel motor patrol boat for U.S. Coast Guard, Washington, D.C.; 125 L.O.A.; 23'6" molded beam; 220 tons displacement; Winton diesel engs.; keel July/26; **launched Nov./26.**

Hull 320, same as above; keel July/26; **launched Nov./26.**

Hull 321, same as above; keel July/26; **launched Nov./26.**

Hull 322, same as above; keel July/26; **launched Nov./26.**

Hull 323, same as above; keel July/26; **launched Nov./26.**

Hull 324, same as above; keel July/26; **launched Nov./26.**

Hull 325, same as above; keel Sept./26.

Hull 326, same as above; keel Sept./26.

Hull 327, same as above; keel Sept./26.

Hull 328, same as above; keel Sept./26.

Hull 329, same as above keel Sept./26.

Hull 330, same as above; keel Sept./26.

Hull 331, same as above; keel Sept./26.

Hull 332; same as above; **keel Nov./26.**

Hull 333, same as above; **keel Nov./26.**

Hull 334, same as above; **keel Nov./26.**

Hull 335, same as above; **keel Nov./26.**

Hull 336, same as above; **keel Nov./26.**

Hull 337, same as above; **keel Nov./26.**

Hull 338, same as above.

Hull 339, same as above.

Hull 340, same as above.

Hull 341, same as above.

Hull 342, same as above.

Hull 343, same as above.

Hull 344, same as above.

Hull 345, same as above.

Hull 346, same as above.

Hull 347, same as above.

Hull 348, same as above.

Hull 349, same as above.

Hull 350, same as above.

Hull 351, same as above.

Charles W. Culkin, Hull 352, diesel-electric vehicular ferryboat for Electric Ferries, Inc., New York; 155 L.O.A.; 48'6" beam; 14'4" depth; keel June/26; launched Oct. 21/26; **delivered Nov./26.**

Governor Moore, same as above; keel June/26; launched Oct. 21/26; **delivered Nov./26.**

Hull 354, same as above; keel June/26; launch early fall 1926.

Hull 355, same as above; keel June/26; launch fall 1926

Hull 356, same as above, keel June /26; launch fall 1926

Hull 357, same as above, keel June /26; launch fall 1926.

Hull 358, barge for Reading Co., 110x32x9.5 ft.; **keel Oct./26.**

Hull 359, same as above; **keel Oct./26.**

Hull 360, same as above; keel fall /26 est

Hull 361, same as above; keel fall /26 est.

Hull 362, barge for Venezuela Gulf Oil Co., 80x24x6 ft.; keel Oct./26; **delivered Nov./26.**

Hull 363, same as above; keel Oct./26; **delivered Nov./26.**

Hull 364, carfloat for Reading Co.; capacity 10 cars; keel winter 26/27 est.

Hull 365, carfloat for Reading Co., capacity 10 cars; keel winter /26-27 est.

Hull 366, carfloat for Reading Co., capacity 8 cars; keel winter /26-27 est.

Hull 367, carfloat for Reading Co., capacity 8 cars; keel winter /26-27 est.

Hull 368, carfloat for Reading Co., capacity 8 cars; keel winter /26-27 est.

Hull 369, carfloat for Reading Co., capacity 8 cars; keel winter /26-27 est.

THE AMERICAN SHIP BUILDING COMPANY

Cleveland. Ohio.

Purchasing Agent: C H. Hirsching.

Wm. McLauchlan, hull 793, bulk freighter for Pickands, Mather & Co.; 580 L.B.P.; 60 beam; 20 loaded draft; 13 mi. loaded speed; 12,000 D.W.T.; T.E. engs.; 2400 I.H.P.; 3 B. & W. boilers 200 lbs. pressure; keel July 19/26; launched Oct. 7/26; deliver Nov. 25/26 est.

Robert Hobon, hull 794, sister to above keel Aug. 9/26; launched Oct. 30/26; deliver Dec. 20/26 est.

No name, hull 795, bulk freighter for Inland Steel Co.; 596 L.B.P.; 64 beam; 20 loaded draft; 13 mi. speed; 13,500 D.W.T.; T.E. engs.; 2700 I.H.P: 3 Scotch boilers, 24'6"x11'x185 lbs.; keel Nov. 8/26 est. launch Jan. 22/27 est.; deliver Mar. 11/27 est

No name. hull 796, bulk freight steamer for Kinsman Transit; 580 feet L.B.P.; 60 feet beam; 20 loaded draft; 13 mi. speed; 12,000 D.W.T.; triple expansion engs.; 2500 I.H.P.; 3 Scotch boilers. 14x11; 159 lbs. pressure; keel Oct. 18/26; launch Dec. 30/26 est.; deliver Feb. 16/27 est.

No name, hull 797, self-unloading bulk freighter for Bradley Transportation Co.; 615 L.B.P.; 65 beam; 20 loaded draft; 14 mi. speed; 13,000 D.W.T.; turbo-electric drive; 4000 I.H.P.; 2 water tube boilers; 325 lbs. pressure; keel Jan. 10/27 est.; launch Mar. 27/27 est.;; deliver July 1/27 est.

Harry Coulby, hull 798, bulk freighter for Pickands, Mather & Co.; 607' L.B.P.; 65' beam; 33' loaded draft; 13 mi. speed; 13,800 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 B. & W. boilers; 200 lbs. pressure; keel Jan. 1/27 est.; launch Apr. 17/27 est.; deliver July 1/27 est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT

Quincy, Mass.

Lexington, hull 1300, airplane-carrier U.S.N., launched Oct. 3/25.

Daniel A. McCormack, hull 1309, ferryboat for City of Boston. 172 L. B. P. 40' 8" beam, 10-4½ draft; 2 Comp. engs. 860 I.H.P.; 2 Scotch boilers; 10' dia., 13' long; keel April 13/26; launched Oct. 9/26; **delivered Oct. 21/26.**

Governor Carr, hull 1401, ferryboat for Jamestown-Newport Ferry Co.; 150'x48'x14'; 703 gro. tons; **keel Oct. 11/26.**

Hull 1402, carfloat, N.Y., N.H. & Hartford R.R.; 360'x40'x11'6"; 1375 gro. tons; keel July 14/26.

Hull 1403, carfloat, same as above; keel July 15/26.

Hull 1404, carfloat, same as above; keel July 16/26.

Hull 1405, carfloat, same as above; keel July 16/26.

Hull 1406, oil barge for City Service Transport Co. 204'x35'6'x14'3".

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT

Wilmington, Del.

No. 21, hull 3506, carfloat for Long Island R.R. Co.; 290 L. B. P.; 42 beam; 11' 6" loaded draft; 1200 gross tons; keel Apr. 29/26; launched Nov. 3/26; **delivered Nov. 6/26.**

Hull 3510, carfloat, So. Ry. Co.; 195'x33'x9'; 480 gro. tons; keel Aug. 23/26; launched Nov. 9/26; **delivered Nov. 15/26.**

Not named, hull 3511, oil barge for Seaboard Shipping Corp.; 170'x37'x12'6"; **keel Oct. 12/26;** launch Dec. 22/26 est.; deliver Dec. 29/26 est.

BETHLEHEM SHIPBUILDING CORP., BALTIMORE DRY DOCK

Baltimore, Md.

Hull 6136, carfloat for Western Maryland R.R.; 190'x35'x9'; keel Aug. 12/26.

CHARLESTON DRY DOCK AND MACHINERY COMPANY

Charleston. S. C.

Purchasing Agent: Charles R. Valk.

Towboat, owner not named, 64 ft. long; **keel Nov. 17/26.**

Dredge for Gulf Refining Co.; 95'x30'x8'; **keel Oct. 11/26.**

CONSOLIDATED SHIPBUILDING CORPORATION

Morris Heights, N. Y.

Evening Star, hull 2842, cruiser, H. H. Demmert; 71'x13'; 2 MR-6-180 H.P. Speedway engs.

Avalanche III., hull 2843, cruiser, Anson Hard; 100'x16'; 2-300 H.P. Speedway engs.

Carminita II., hull 2844, cruiser, G. E. Halliday; 60'x13'; 1-115 H.P. Speedway eng.

Marinette II., hull 2846, cruiser, E C. Romph; 74'x15'; 2-300 H.P. Speedway eng.

Kegonsa, hull 2847, cruiser, G. Dahl; 81'x14'; 2-500 H.P. Wright Typhoon engs.

Hull 2859, cruiser, Dr. J. A. Vietor; 82'x14'6"; 2-300 H.P. Speedway engs.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.

Philadelphia, Pa.

Purchasing Agent: Ed. C. Geehr.

Malolo, hull 509, express psgr and frt liner, **Matson Navigation Co.; 582 LOA; 577 length at water line; 83 ft beam; depth molded to C deck** 54 ft.; displacement 22,050 tons; 8250 DWT; speed 22 knots regular, 23 knots **maximum; 25,000 shaft horsepower; Cramp-Parsons turbines; oil** burning B & W water-tube boilers; keel May 4/25; launched June 26/26; deliver May 1/27 est.

Yarmouth, hull 518, twin screw passenger and **freight steamer for Eastern Steamship Lines; 378 length at water line; 55-6 beam; 29-6 molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears, six single-ended** Scotch boilers; keel Feb. 23/26; **launched Nov. 6/26**

Evangeline, hull 524, twin screw passenger and **freight steamer for Eastern Steamship Lines; 378 length at water line; 55'6" beam; 29'6" molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears; 6 single-ended Scotch** boilers; keel May 1/26; launch Mar. 1/27 est.

Hull 528, steel carfloat for Pennsylvania R.R.; **250' molded length; 34' molded breadth; 9' molded** depth; **delivered Oct. 21/26.**

Hull 529, same as above; keel July 28/26; launched Oct. 21/26; **delivered Nov. 13/26.**

Hull 530, same as above; keel Aug. 17/26; launched Nov. 15/26; **delivered Nov. 26/26.**

Salt Lake City, hull 531, light cruiser for United States Navy; 10,000 tons displacement; keel Apr./27 est.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

Purchasing Agent: G. O. Williams.

Comoco, hull 122, steel yacht for R. W. Judson, Detroit; 140' L.B.P.; 23'6" beam; 8'9" loaded draft; 15 mi. speed; 260 D.W.T.; 600 I.H.P. diesel engs; **keel Dec. 15/26;** launch May 1/27 est.; deliver June 1/27 est.

Not named, hull 121, steel yacht, owner not named; 105 L.B.P.; 17' beam; 6' loaded draft; 13 mi. speed; 110 D.W.T.; 200 I.H.P. diesel engs.; keel Nov. 1/26; launch Apr. 15/27 est.

DRAVO CONTRACTING COMPANY

Pittsburgh, Pa.

Hulls 495-502 inc., 8 steel barges for stock; 230 **x45x11 ft.; 650 gro tons ea.**

Hulls 438 and 503; 2 steel barges for Keystone Sand & Supply Co.; 135'x27x6'; 320 gro. tons ea.

Hulls 517-530 inc., 14 steel barges for U.S. Engineers, **St. Louis, Mo.; 55'x16'x3'; 26 gro. tons** each.

Hull 531, 1 diesel engine towboat, Wheeling Steel Corp., Wheeling, W. Va.; 110'x26'x5'; 215 gro. tons.

Hulls 532 and 533, two steel barges, for stock 55x16x3ft.

Hull 534, 1 ladder type sand and gravel dredge for Pittsburgh Plate Glass Co.; 155x44x8ft., 430 gross tons.

Hulls 535-538 inc., four steel whirler boat hulls for Contracting Dept.; 40x48x5'6"; 100 gro. tons.

Hull 539, 1 diesel engined towboat for Labelle Transportation Co., 110'x26'x5'; 215 gro. tons.

Hulls 544-550 inc., 7 pile driver hulls for U.S. Engineers, St. Louis; 88'x25'x4'; 100 gro. tons ea.

Hulls 540-543 inc.; 4 steel barges for Keystone Sand & Supply Co.; 135'x27'x8'; 320 gro. tons ea.

Hulls 551-552, two pile driver hulls for Fruin-Colnon Contracting Co., St. Louis; 88'x25'x4'; 100 gro. tons ea.

Hull 553-566 inc., 14 steel barges for Mississippi River Commission, Memphis; 120'x30'x7'4"; 430 gro. tons ea

Hulls 569-572 inc., 4 steel hopper type barges for Pittsburgh Plate Glass Co., 135x26x10 ft. 320 gro. tons ea.

DUBUQUE BOAT & BOILER WORKS

Dubuque, Iowa

Purchasing Agent: A. L. Yehger.

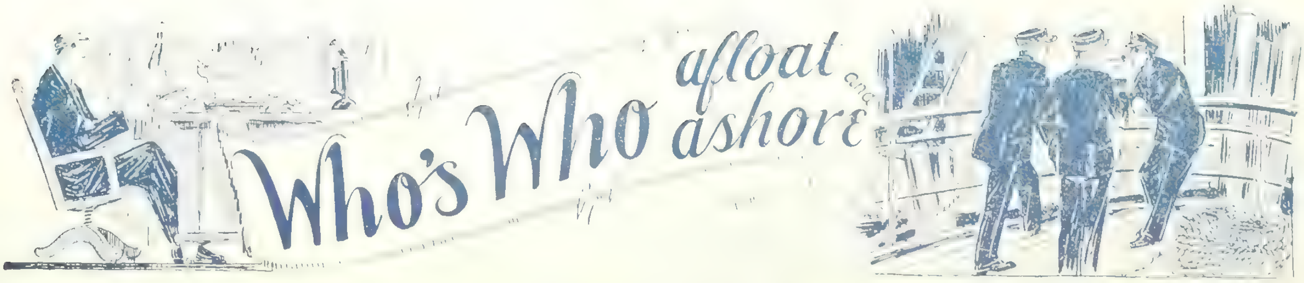
Two steel dump scows for U.S. Engineers, Louisville, Ky.

Thorpe, river towboat for Upper Mississippi Barge Line Co. & Inland Waterways Corp.; 132'x35'x3'6"; stern wheel, tandem comp. surface condensing engs.; 15"x30"x78" stroke; keel Oct. 1/26 est.; launch Mar. 1/27 est.; deliver Apr. 1/27 est.

Weber, river towboat, sister to above; keel Oct. 1/26 est.; launch Mar. 1/27 est.; deliver Apr. 1/27 est.

Morse, river towboat, sister to above, keel Oct 1/26 est; launch Mar. 1/27 est; deliver Apr. 1/27 est.

Who's Who afloat and ashore



THERE is quite a bit of controversy reported going the rounds of San Francisco shipping circles in reference to which of the three channels of the Golden Gate should be dredged.

Secretary of the Navy Wilbur recommended that the main channel be dredged to a depth of 50 feet. The Board of Engineers for Rivers and Harbors has steadfastly maintained, it is reported, that the central channel should be developed. This was deepened to 42 feet in the three years of dredging which was recently completed. Most shipping interests and the Bureau of Lighthouses have favored Bonita or North Channel, which skirts the Marin shore, while some coastwise steamship lines wanted the South channel dredged deeper.

However, while this controversy is in progress members of the United States Coast and Geodetic Survey state that there is another vote to be considered—the franchise of the sea, which engineers point out, has often rendered futile man's attempts to alter nature's scheme at harbor mouths.

Purser W. S. MacLean with "Cristobal" and Chief Engineer Eniar Lindquist with "Panama" on the motorship City of Panama.

Charles L. Wheeler, vice-president and general manager of the McCormick Steamship Company, is now in the East on an extended visit. During this trip he will confer with the operators of the new Redwood Line which was recently established out of Gulport, Mississippi, and for whose account the McCormick interests are local agents.

Mr. Wheeler will visit various key ports of the Atlantic where representatives and terminals of the McCormick Company are located.

J. J. McCarthy, veteran official in charge of the automobile ferry as agent for the Southern Pacific Company, San Francisco, states that the 12 months of 1926 will witness the heaviest transportation of automobiles across San Francisco Bay in the history of the local ferries.

The estimated total for 1926 is 4,000,000 vehicles.

"Ships and People" is the title of an interesting book that is creating much comment in Atlantic maritime circles. The book is the work of Dr. J. C. H. Beaumont, senior surgeon of the White Star liner Majestic, who has just completed his eight-hundredth crossing of the Atlantic.

The book may be described as a singularly interesting work on the part of a surgical mariner who has missed very little while watching the great game of life on the rolling deep. Dr. Beaumont tells in his book that he knows as much of the cause and cure of seasickness at the end of thirty years as he did at the beginning.

A delicately handled but authoritative chapter in the publication deals with the effect of climate on behaviour and manners among ocean voyagers.

Two ship cats on the Panama Mail Steamship Company's motorship City of Panama have been causing their owners a bit of trouble during the last two voyages. "Panama," one of the felines, is the property of Chief Engineer Lindquist and "Cristobal" belongs to Purser W. S. MacLean.

During one of the southbound voyages "Panama" left ship A.W.O.L at San Jose de Guatemala. The vessel headed south to Cristobal. During the voyage "Cristobal" was inconsolable and Purser MacLean had a hard time to make the cat eat.

On the northbound voyage "Panama" was waiting on the pier and the joy of the two felines was unconfined. During the trip to San Francisco, however, two pet canaries mysteriously disappeared, and while the finger of suspicion was directed against the two cats, the evidence was not strong enough to convict them, despite several feathers found in the haunts of "Panama" and "Cristobal."

E. Donovan Orton is now purser on the Panama Mail liner Corinto succeeding T. J. Sullivan, who was shifted to the Colombia to relieve Warren Brown.

Chief Engineer John L. Friar is recovering from an illness which forced him to temporarily resign his post on the Charles Nelson steamer Mukilteo. During his shore-side stay Hugo Pflueger, first assistant, succeeded Mr. Friar.

Francis J. Mathewson has the distinction of rising from third assistant to first assistant engineer of the Dollar liner President Polk while the vessel was on her world-girdling voyage.

Fully recovered from an illness that forced him to remain shoreside for some time, Fred C. Seeba, Jr., is back in the engine room of the Matson liner Enterprise in his former position as first assistant.

The freighter West Chopaka's engine room is now in charge of Chief Engineer E. C. Mathewson, vice Charles W. Miller, who is on an extended leave of absence. As soon as he was appointed chief engineer Mr. Mathewson drafted Paul Tube as his first assistant.

Herbert Anderson, who served for many years as manager of the chartering department of Suzuki & Company in San Francisco and who is known to all shipping men, wrote friends from his new headquarters in Seattle that he certainly misses the old faces and atmosphere of the floor of the Exchange. Mr. Anderson went with Suzuki & Company to Seattle when the Japanese company moved their headquarters to the Puget Sound city from San Francisco.

Word has been received that at time of publication the famed old barkentine C. D. Bryant is moored at the Panama Canal and has been condemned by port officials. The craft was en route to Cape Town, South Africa, with a lumber cargo, when she was forced to return to Cristobal in distress. Old-time deep-sea skippers know the C. D. Bryant well as one of the fastest sailing ships that plied out through the Golden Gate to the Hawaiian Islands and South Seas in years gone by.

With the appointment of Captain Randall Rogers as pilot at San Pedro there are now eight pilots handling the traffic in and out of that port. Cap

(Continued on Page 16)

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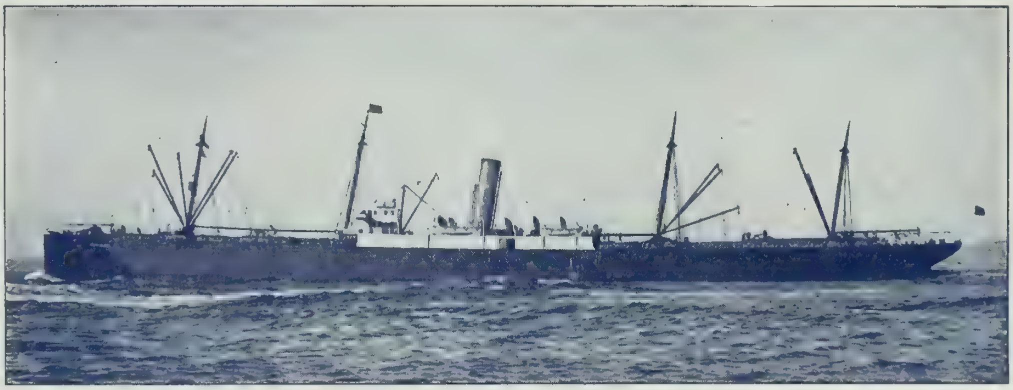

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Walker Ross, Inc., General Agents.

Board of Trade Bldg. Phone Broadway 7574.

FREIGHT ONLY.

SAILINGS—Monthly from Portland to Yokohama and Kobe; or Osaka, Nagoya as inducements offer.

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Yamashita Company, 1109 Porter Building.

FREIGHT ONLY.

SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe, and irregular service from China and Japan ports to San Francisco, Portland, and Seattle.

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BLUE FUNNEL LINE, LTD.

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Yorkshire Building. Phone Seymour 9576

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SAILINGS—Every 21 days from Vancouver, Victoria, and Seattle to Yokohama, Kobe, Miike, and Hongkong.

CANADIAN PACIFIC STEAMSHIPS, LTD.

Canadian Pacific Railway Station. Phone Seymour 2630

PASSENGERS AND FREIGHT.

SAILINGS—Every 14 days from Vancouver to Japanese ports, Shanghai, Hongkong, and Manila

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SAILINGS—Every 2 weeks to all ports in Japan and China, also Vladivostok, Singapore, Bombay, etc.

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837 Hastings street, W. Phone Seymour 7147.

FREIGHT ONLY.

SAILINGS—Irregular service between Pacific Coast ports and Japan ports.

WALKER-ROSS, INC.

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SAILINGS—Fortnightly from Vancouver, Seattle, Portland, San Francisco and Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

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SAILINGS—Every 30 days from San Francisco and Los Angeles to United Kingdom, Continental ports and Scandinavia.

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Sudden & Christenson, Pacific Coast agents.

230 California street. Phone Garfield 2846.

For passengers. Phone Sutter 46.

PASSENGERS AND FREIGHT.

SAILINGS—Fortnightly from Vancouver, Seattle, Portland, San Francisco, and Los Angeles, to Antwerp, Hamburg, and Bremen; with call at United Kingdom ports when inducements justify.

SEATTLE

EAST ASIATIC COMPANY, LTD.

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1222 Alaska Building. Phone ELiot 9104.

PASSENGERS AND FREIGHT.

SAILINGS—Regular service, Pacific Coast ports direct to Hamburg, Hull, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.

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Alaska Building. Phone ELiot 2450.

FREIGHT ONLY.

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705 Arctic Building.

PASSENGERS AND FREIGHT.

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SAN FRANCISCO LOS ANGELES

Who's Who

(Continued from Page 20)

to be assigned to other vessels of the company.

E. Donovan Orton succeeded T. J. Sullivan as purses, Sullivan going to the liner Colombia. W. F. Wood went out as third officer on the Corinto, and Joseph Rosales took the place of James Fyfe as chief steward, the latter being changed to the steamer Colombia.

J. A. Bean resigned as second officer of the steamer Corinto and was succeeded by Samuel Erickson. Mr. Bean is going on an extended vacation before returning to the sea.

Daulton Mann, general manager of the Panama Mail Steamship Company, announces the assignment of Christian Hansen to the offices of the company in Champerico after many months of service at headquarters, and the shifting of W. W. Hoffman from freight clerk on the liner Venezuela to San Jose de Guatemala. Both started their new duties the first of the year.

The tonnage movement in and out of the port of San Francisco for the twelve months of 1926 will approximate the record of the preceding year, according to Abe Marks, manager of the marine department of the Chamber of Commerce.

During the twelve months of 1925 a total of 6655 vessels, representing a total of 15,224,732 tons arrived in port, and 6726 vessels with a total of 15,132,933 tons departed.

While the complete figures will not be issued for 1926 until compiled about the middle of this month, the figures for the eleven months of last year show that a total of 5283 vessels representing a tonnage of 14,558,533 tons, arrived and that 6322 vessels, or 14,484,242 tons sailed for the eleven months ending November 30, 1926.

Advices received state that the five-masted schooner Rose Mahony, one of the finest ships of her type to sail the Pacific, has been abandoned at

(Continued on Page 30)

SHARPLES

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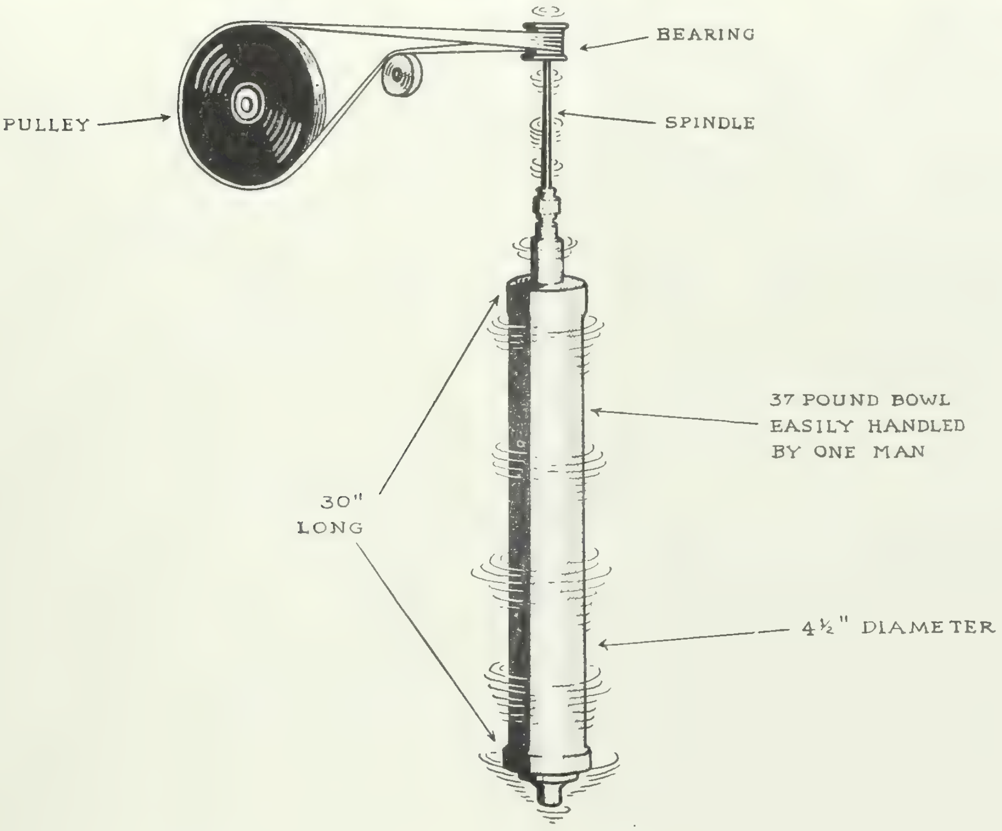

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SHARPLES

A GREAT FORCE

Who's Who Afloat and Ashore

(Continued from Page 22.)

Miami, Florida. The vessel sailed from the Pacific Northwest lumber laden for Florida, and while in port was hit by the hurricane that swept that coast.

The violence of the storm sent the Rose Mahony high and dry, where she has remained ever since. The vessel is owned by Andrew F. Mahony of this city, but the reports state that with the exception of salvaging the gear and anchors no attempt has been made to recover the craft as yet and apparently no efforts to this end will be acted upon.

The crack steamship H. F. Alexander is expected to be laid up the end of this month in Seattle during the slack winter coastwise passenger business. With the exception of Captain George H. Zeh, master, the entire engine room personnel will remain aboard to overhaul the H. F. Alexander. The liner will re-enter service about the middle of April.

Dedicatory ceremonies will be held the middle of this month at San Francisco in celebration of the opening of the new Point Lobos lookout station of the marine department of the Chamber of Commerce. The station, one of the finest maritime stations in the world, is to be equipped with the latest glasses and aids for the sighting of vessels approaching and departing the Golden Gate.

Civic and government officials, heads of the Chamber of Commerce, and leaders in the shipping world will participate in the formal opening of the new lookout station which sits upon the most advantageous part of Point Lobos overlooking the sea at the entrance to the Golden Gate.

Arrangements for the ceremonies are being directed by J. C. Rohlfs, manager of the marine department of the Standard Oil Company (Calif.), who is chairman of the marine committee of the maritime department of the San Francisco Chamber of Commerce. Frank O'Connor, manager of the Donovan Lumber Company, vice-chairman, and assisted by the following officials of the marine department:

Hugh Gallagher, operating manager of the Oceanic Steamship Company; Ralph Meyers, manager of Hobbs, Wall & Company; Captain Ryland Drennan, port captain of the Panama Mail Steamship Company; Captain James Ludlow, operating manager of the California Stevedoring & Ballast Company; Captain Walter J. Peterson, manager of the Pacific American Steamship Association; J. C. McCabe, manager of A. F. Mahony; Michael J. Buckley, traffic manager of the Dollar Steamship Company; J. P. Williams, secretary to the marine department of the Chamber of Commerce; and Abe Marks, manager of the Marine Department of the Chamber of Commerce.

Captain J. A. Gries, master of the liner Admiral Farragut, is back on the bridge of his vessel after an extended vacation. He reported that he put in his time tilling his garden in Berkeley, preparatory to the spring planting.

Chief Engineer James George has had a variety of ships during the past three months. He has been relief engineer on all of the vessels of the Admiral Line during the vacation period. His last change was on the Admiral Farragut, when he replaced Chief Albert Tucker. All vacations, both for bridge and engine room officers, are now at an end in the Admiral fleet.

Captain Davey, who had temporary command of the **Makura** while **Captain Mawson** was on leave, used to have the big freighter **Hauraki** in the trans-Pacific trade. Once when docking at Auckland his ship was going full speed ahead on both engines and swinging into her berth. Two small passenger ferries were crossing just astern and the rush of water caught one and swung her against the other, making a crash which could be heard some distance but without doing serious damage. Captain Davey says that afterwards when a witness was wanted on his ship not a man had seen the collision. While this looked like a tribute to the discipline he kept, every man having his eyes on his job, it is just possible that the group of sweethearts and wives on the pier-head was a more attractive magnet.

Captain Trask of the steamship **Sierra** won a reputation as a whale tamer when he was in the **Sonoma.** Once, he says, he hit one so hard he had to back out. Another time he picked up a little one and carried it into Auckland on his bows. It fell off when he anchored. Recently the captain met the champion whale man in the South Pacific, **Captain Post** of the New Zealand government service, who knows every cacholot and seraglio in the south seas. In a misguided moment, Captain Trask began talking of whales, and when Captain Post got a word in, he just smothered his guest with whales. **Manager Brown** of the **Matson Line's** Sydney office had to dig him out with a harpoon, and the last he heard from Post was something about 300 whales which followed a ship looking for a Jonah.

Hurry-On Meyer is the nickname given in Sydney to Captain Meyer of the **Ventura**, because he is always in an all-fired hurry to dock when he arrives. Once, when he got in two hours ahead of schedule, he "lifted his pick" and steamed up harbor without waiting for the customs officials. A stray newspaper man who had run down early to photo the transference of mails was asked to send a message ashore that Meyer was coming right up. Even the company's agent was surprised. Last trip he got through the doctor's examination before the customs came down in their launch. So he hoisted his gangway and made for the dock. On his way he met the customs men and had to stop and pick them up. He let down a rope ladder, but the customs chief stood off and hollered, "Lower your gangway." Meyer didn't like doing it but the Customs held the ace and he had to.

Captain Jack Mawson is well posted in the attractions of scenic Australia and New Zealand, as he resumes command of the **Union** liner **Makura.** The first portion of his two months' leave was spent on the South Coast of New South Wales, Australia, and in the Blue Mountains. He then crossed the Tasman to New Zealand to revel in the languorous delights of Rotorua, the thermal wonder of the world, and to visit those fishing waters which have been made world famous by the pen of that great fisherman Zane Grey. Captain Mawson is one of the best-known and popular skippers in Australia and on the Pacific Coast and a confirmed Bridge player. On a stormy passage his bridge parties in his cabin had to be abandoned, and when port was reached a passenger said to him, "I'm sorry you missed your bridge." "Bridge!" exclaimed the captain, who had been "on top" for 36 hours, "I've had enough bridge to last me a month."

A representative of a San Francisco repair and supply business recently went aboard a British steamer to obtain the captain's signature to bills for materials and work done for the vessel. The captain, a jovial son of Great Britain, with the hospitality or his race, invited the shoreside man to come and have a little drink in the cabin after the business was over.

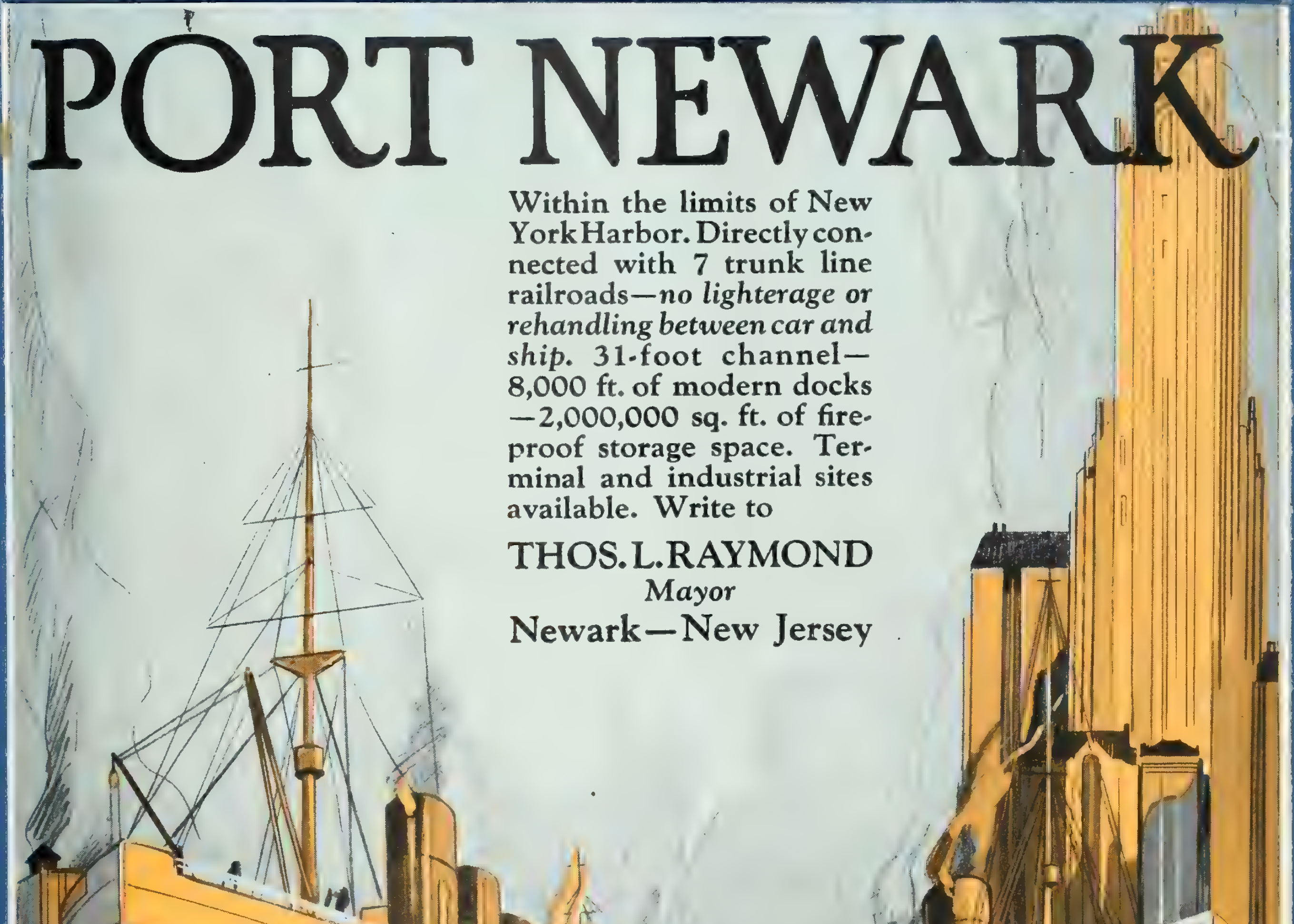
When the seclusion of the cabin was gained, the captain opened up a locker and took out a bottle labeled "Scotch." It was opened and a generous glass offered the mate, who drank it down. None was given the shoreside man, nor did the captain take any, but the business of signing the bills was taken up.

The mate still sat at the table with them, and nothing further was said regarding the drink which had been promised. Some more minutes passed, when the captain remarked, "Well, the mate is still alive, so I guess it's all right for us to take a shot of this Scotch that I bought from a bally bootlegger."

Pacific Marine Review

The National Magazine of Shipping

February, 1927



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OF THE PACIFIC COAST

Pacific Marine Review. Vol 24 No 2. Published Monthly at San Francisco. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. $2.00 a year.

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BRUNSWICK KROESCHELL

REFRIGERATION

S. S. Chatham

S. S. Fairfax

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THESE three M. & M. ships are excellent examples of the study and care taken to make the living conditions on board ship the equal if not the superior of the best obtainable on land. To this result Brunswick-Kroeschell Refrigeration has contributed in no small measure.

On each of these three ships the refrigerating load is made up of bulk stores refrigerators, pantry service refrigerators and water cooling for drinking purposes. Ice and ice cream are not made on board; these products are bought and stored under refrigeration.

The **bulk stores** refrigerators are grouped on the main deck, starboard side and in line athwart-ship with the engine room casing. This group consists of:

Bulk Stores	Size Cu. ft.	Temp. °F.
Ice	460	28-30
Meat	643	25-28
Fish	121	20-24
Ice Cream	65	0-15
Milk and Dairy Products	124	36-40
Meat and Vegetables	460	35-38

The **pantry service** refrigerators are grouped in location corresponding to that assigned to the bulk stores refrigerators but on the port side. The news stand refrigerator belongs in this group but it is located on the promenade deck. This group consists of:

Pantry Service	Size Cu. ft.	Temp. °F.
Salad	90	40-45
Pastry	90	40-45
News Stand	30	40-45
Ice Cream	3-can	10-15

The **water cooling** service consists of a 150 gallon water-butt with steam pump for recirculating the cooled water to the conveniently located water stations.

The **ice machinery room** is located on the main deck directly forward of the bulk stores refrigerators and with easy access from the main engine room. There are two Brunswick four ton compressors with steam engines and high pressure side; one of the compressors is intended as a spare. The water butt is located in the ice machinery room. All refrigeration is by direct expansion with the addition of congealing tanks in the first three refrigerators of the pantry group.

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Merchants and Miners Transportation Company of Baltimore Serve the Entire Atlantic Coast with Fleet of Modern Passenger Liners

The express freight and passenger coastwise liner Chatham, which, with her sister ships Dorchester and Fairfax recently delivered to the Merchants and Miners Transportation Company by the Newport News Shipbuilding and Drydock Company, is giving first-class service along the Atlantic Coast from Boston to Miami.

IN this year the Merchants and Miners Transportation Company of Baltimore have completed seventy-five years of coastwise steamship service under the American flag. Organized by business men of Boston and Baltimore in 1852, this firm has passed through practically all of the development stages in modern naval architecture and marine engineering. Its first vessel was a wooden sidewheeler with a single expansion, low pressure, jet condenser, walking beam engine burning soft coal in return fire-tube boilers.

The Merchants and Miners line has always followed a progressive policy of anticipating demand for accommodation. Its latest and most notable addition to a large fleet of freight and passenger steamers is the trio of coastwise liners delivered during 1926 by the Newport News Shipbuilding & Drydock Company. These vessels are named Chatham, Dorchester, and Fairfax. Together with the Alleghany and Berkshire, these ships form one of the largest and finest passenger fleets now operating in the Atlantic coastwise trade. The Merchants and Miners Transportation Company serves the ports of Boston, Providence, Philadelphia, Baltimore, Norfolk, Savannah, Jacksonville, and Miami—or along the entire Atlantic Coast.

The new steamers are 368 feet long over-all and 52 feet beam, with a gross tonnage displacement of approximately 7000 tons, and are oil burners. The new ships differ slightly in construction from the Alleghany and Berkshire in that the dining room is located on the main deck, which allows additional space on the upper decks for staterooms. The passenger accommodations of each of the ships is for 314 persons. There are four suites with private baths on each ship just forward of amidships, 30 rooms with beds, 98 double-berth rooms, and 8 single-berth rooms. Three rooms have private tub baths and 16 are equipped with showers. These baths have hot and cold fresh and also hot and cold salt running water. The staterooms are large and well ventilated. Most of the rooms have two doors, one opening on deck and one to the corridor.

These steamers offer all the comforts of a first-class hotel and a home combined. The public rooms consist of a beautifully appointed dining room, music room, smoking room, lounge, writing room, social hall, dance pavilion, and sun parlor, also a barber shop and magazine stand. The furnishings, lighting, draperies, and color tones throughout the ships are conducive to rest, comfort and luxury. The abundance of deck space is one of the outstanding features of these ships. There are three decks for passengers, two promenade and one top or boat deck. This feature provides ample room for recreational games, such as shuffle board, quoits, deck golf, volley ball, and the universal constitutional. The public rooms are well equipped for music, dancing, and cards.

An intercommunicating telephone system with central station and with connections in every stateroom was installed by Chas Cory & Son, Inc. of New York. The stateroom sets are of the European type with receiver and transmitter attached to a common hand bar. The system is said to be the first of its kind ever installed on shipboard and, judging from reports, it is working perfectly.

All staterooms, public rooms, and enclosed deck promenades are equipped with the new frameless plate glass windows developed for marine use by the Kearfott Engineering Company of New York. These windows operate in felt lined grooves on the same principle as those of an enclosed type automobile. The sheet of plate glass is rigidly held at its lower edge in a bronze bracket which engages a lead screw. This lead screw turns in ball bearings top and bottom and is actuated by small worm and worm wheel operated by a hand crank. The mechanism eliminates all troubles with springs and adjustments and holds the window at any point desired from complete closure to full opening.

An interesting feature of the public rooms and staterooms on the Dorchester, the Chatham, and the Fairfax is the large use of Haskelite in the joiner work. Practically all bulkhead, side wall, and ceiling paneling is of this structural plywood product, which is rapidly coming to be almost a standard specification in American marine practice. Plymetl, the metal sheathed Haskelite, was extensively used in bath rooms and in the galley.

Speaking of galley, the three steamers under discussion are equipped with a modern hotel kitchen equipment that almost requires a new sea term in naming the domain of the "doctor." All the latest steam and electrical equipment necessary or usable has been installed.

The vessels are provided with every aid for safe and efficient navigation, including among other things a Sperry high intensity searchlight, engine speed indicator, gyro-compass with bearing position, steering position, and course recorder and a self-synchronous helm angle indicator. The new steamers are also equipped with the smoke alarm signal system, which locates the slightest trace of smoke in any section of the ship.

The power plant on these new vessels consists of four oil-fired Scotch marine boilers delivering steam at 220 pounds pressure to a triple expansion engine directly connected to the single propeller. The engine is rated at 3000 horsepower and drives the hull at 13½ knots speed. Steam is used for nearly all auxiliaries and for heating of crew and passenger quarters.

Forced draft is used in the furnaces, pressure being provided by a Sturtevant steel plate fan driven by two Sturtevant vertical single-cylinder steam engines, one on either side of the fan.

A rather novel arrangement of the hot water system was developed by the naval architects in order to conserve fresh water. The hot water in the system is circulated constantly by a small auxiliary pump. This means that hot water is always available at the taps without the necessity of drawing out and wasting a considerable quantity of water before the desired temperature is secured. This item is, of course, of great importance on shipboard where fresh water must be made up by evaporation. Another item of interest is that the coils used in both the hot water heater and the feed water heater are similar and interchangeable. This, of course, simplifies the carrying of spares.

The heaters for water, feed water, and fuel oil were supplied by the Griscom-Russell Company.

In line with the policy of making their passenger ships first class hotels afloat, the Merchants & Miners Transportation Company installed an unusually complete refrigeration system on the three steamers. The cold storage rooms are located on the main deck, directly aft of the ice machinery room. Those for the bulk stores are on the starboard side and contain 1873 cubic feet divided into six compartments for separate storage of ice cream, fish, meat, ice, vegetables and milk, with temperatures ranging from 15 degrees Fahrenheit for the ice cream to 40 degrees Fahrenheit for the milk. The pantry service refrigerating space is on the port side, with four compartments aggregating 210 cubic feet and three cans of ice cream. There is also a water-cooling butt of 150 gallons capacity for ice water. Two 4-ton Brunswick compressors driven by steam engine take care of this load very nicely. This machinery was installed by the Brunswick-Kroeschell Company of New Brunswick, New Jersey.

All cargo is handled through side ports, the capacity of each vessel being about 3300 tons.

The electric lighting load is carried by a Terry steam turbo-generating set, and auxiliary lighting is provided for by the installation of a Matthews self-contained gas engine electric light set.

These three steamers are a credit to their designers, builders, and owners. The care taken to insure comfort and recreation features and the elaborate nature of the equipment and furnishings are indicative of the trend in the demand of the American traveling public and of the success which attends careful management in the American coastwise transportation business.

The Merchant Marine

By C. E. Hydes

THE future of our emergency fleet and the vessels that are to follow, if we propose maintaining any supremacy in foreign commerce, depends upon wise legislation in Washington the coming session, and the support our flag receives from the importers and exporters of the United States.

Much publicity has been given the plea of T. V. O'Connor, chairman of the Shipping Board, for the development of our merchant marine. The message carries with it the vital facts that should be understood and appreciated by all interests. Statistics indicate that at least 15 per cent of American production is exportable, and if markets are denied us, as they surely will be unless we control the carriers, the surplus will be the added straw that destroys our contented prosperity.

American banks and insurance companies should likewise be encouraged to establish direct branches in other countries as the balance wheel of our progress.

Economists declare our foreign commerce will always be sporadic and subject to attack, unless fortified by American banking and American insurance abroad.

It may surprise many to know that competition, together with legal complication, confines American banking and insurance interests almost exclusively to North America, while our liberal views admit foreign companies to our forage with slight restrictions, thus permitting such foreign concerns to grow fat in lands denied American concerns and drain the resources of this country through so called invisible exports.

Support of the merchant marine, American banks and insurance, the establishment of free zones, and adoption of the Metric standards will place our foreign commerce on a safe and sound practical basis and protect our country in its construction program.

To people engaged in industry on the fringe of the United States, no propaganda is required, but to those remote from the tang of the salt air and not in sympathy with the people who go down to sea in ships; to these people we should appeal.

We are serious about this matter—the dormant national spirit must be aroused, the lack of which is plainly noticeable and only develops as war threatens or some great calamity—and a real calamity is now ahead of us, unless we exert reasonable influence on our representatives in Washington, and bring the subject to the notice of the entire country.

(Reprinted from Pacific Commerce.)

14 *more* GYRO-PILOTS *are signing crew lists*

Pilot house
of the
M S Tampa

EXPERTS of the Shipping Board, in planning the conversion of fourteen steamships to diesel propulsion, were confronted with a multitude of problems in addition to the main one of propulsion machinery. On the converted ships no steam would be available for operating deck winches, pumps, anchor engines or steering machinery.

Standard electrical equipment could be substituted in most cases, but the conversion of the steering machinery of these ships was an unusually difficult problem, as it was so generally built into the ships that complete substitution was both difficult and costly. *Shipping Board engineers solved this problem by a plan of substituting an electric motor for the steam engine and controlling it from the bridge through the Sperry Gyro-Pilot.*

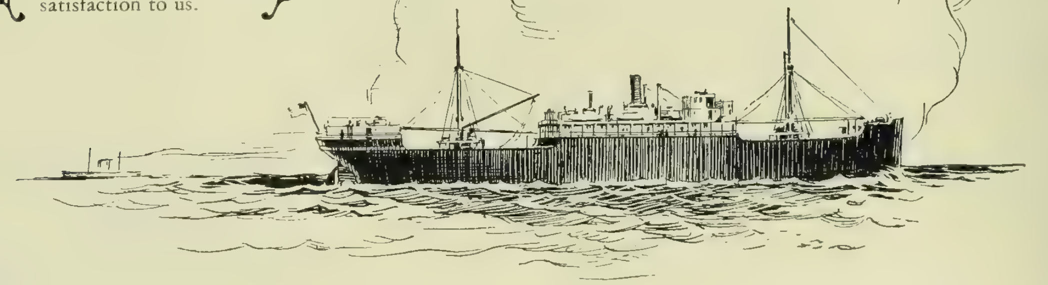
Three of these converted vessels, the M/S TAMPA, WEST HONAKER and UNICOI, have completed highly satisfactory trials and the two latter are now enroute to foreign ports with valuable cargoes—the M/S TAMPA has completed its first voyage to Bremen and return—all with Sperry Gyro-Pilots at their helms.

Let us solve your steering gear problems.

SPERRY

Mr. H. E. Brelsford, Chief of the Technical Department of the U. S. Shipping Board, says:

"The performance of the Sperry telemotor and steering equipment has been most satisfactory and has not given the slightest trouble. Its performance has been a source of great satisfaction to us."

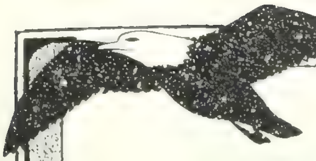


THE SPERRY GYROSCOPE COMPANY

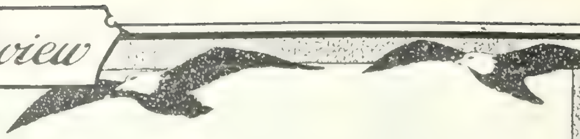
LONDON NEW YORK TOKYO

Representatives in

CLEVELAND LOS ANGELES PHILADELPHIA SAN FRANCISCO SEATTLE



Pacific Marine Review



CONTENTS

February, 1927

Seventy-Five Years' Coastwise Service .... Insert

Shipbuilders Association Nationwide 57

Here and There on the Pacific Coast 58

Public Terminals of Seattle 59

Bunkering with Richfield 60
Efficient facilities at convenient locations in California ports.

Radio Communication, by G. Harold Porter 62
Its development and present status in America, with particular reference to the photo radiogram service.

Increasing Aids to Navigation 63

Deterioration of Concrete in Sea Water and Preventative Methods, by George F. Nicholson 64

Everett, Washington, by M. B. Ames 68
A typical Puget Sound lumber port.

How Our British Friends Do It, by Norman F. Titus 69

South Pacific News. Special Correspondence 71

Nelseco Busy on Ferryboat Engines, by J. S. Hines 72
Notes on a recent visit at Groton to inspect the engines for the San Francisco Bay ferries.

Large Diesel-Electric Savings 74

Diesel-Electric versus Steam Drive for Stern Wheel Towboats, by Harry W. Parsons 75

The Diesel-Electric Drive from the Marine Engineer's Standpoint, by Robert C. Pairman 77

Degeneration of Chinese Pirates, by Frank C. Bowen 78

Steam versus Diesel, by V. W. Hoxie 79
Some points that should receive consideration.

Developments in Small Diesel Engines 80
New line of Fairbanks-Morse diesel engines in 10 h.p. cylinder size shows trend in design. Small diesels are now on a par with large main units.

Pacific Workboats and Their Power Plants:

- At the San Francisco Boatyards 82
- New Atlas-Imperial Unit 83
- Hicks Reorganization 83
- Important Diesel Announcement 84
- Diesel Tug Samson 84

Auxiliaries, Ship Supplies, Marine Equipment:

- The Dahl Electric Organization 85
- Winton Executive Visits Europe 85
- Tail Shaft Lubrication 85
- Pacific Executive Honored 85
- Notable Auxiliary Installation 86
- Ray Burner Economy 86
- New Automatic Welder 86
- Cutting Metals Under Water 87
- John Crane Packing 87
- Cory Fire Alarm Systems 88
- The Victory Valve 88
- Fire Protection on E. T. Bedford, by T. J. Kauffeld 89
- The Most Important Thing in Welding 89
- Heavy Forgings 89
- Plibrico Flexo-Anchor 90
- Reclaiming Circuit Breaker Oil 90
- Flashing the Whistle 90
- A Good Maintenance Record 90
- Automatic Valve for Telemotors 90
- Federal Appoints New Agents 96

Marine Insurance 91

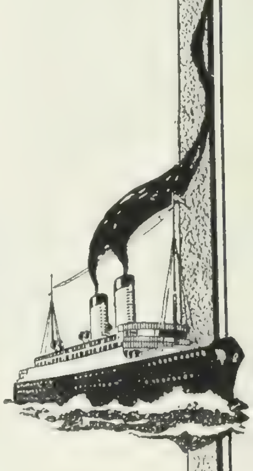
American Shipbuilding 97

Index for Volume XXIII., 1926 105

Accident Prevention Work in Passenger, Automobile, and Freight Ferry Service, by W. S. Wollner .... 53 Adv. Sec.

Of a General Nature:

Chartering Business Increases, 73; Bethlehem Executive Honored, 74; New N.Y.K. Liners, 74; A Pool on Small Hulls, 81; Trade Literature, 88; Freights, Charters, Sales, 96; Who's Who Afloat and Ashore, 13 Adv. Sec.; Directory of Shipping, 15 Adv. Sec.; Tramp Steamer Disappearing, 48 Adv. Sec.; Looking for Trade Overseas, 48 Adv. Sec.



DEDICATED TO
PACIFIC OCEAN SHIPPING

UNION

"ATLANTIC"

110 ft. long; 25 ft. beam; 7 ft. 6 in. draft.

Equipped with a 300 H.P., 6 Cyl. UNION Diesel Engine.

The boat was designed by M. Madruga, and built by the Campbell Machine Company, San Diego. Owned by Messrs. Medina and Soares.

The boat is under contract to the San Diego Packing Company, Point Loma, San Diego, California.

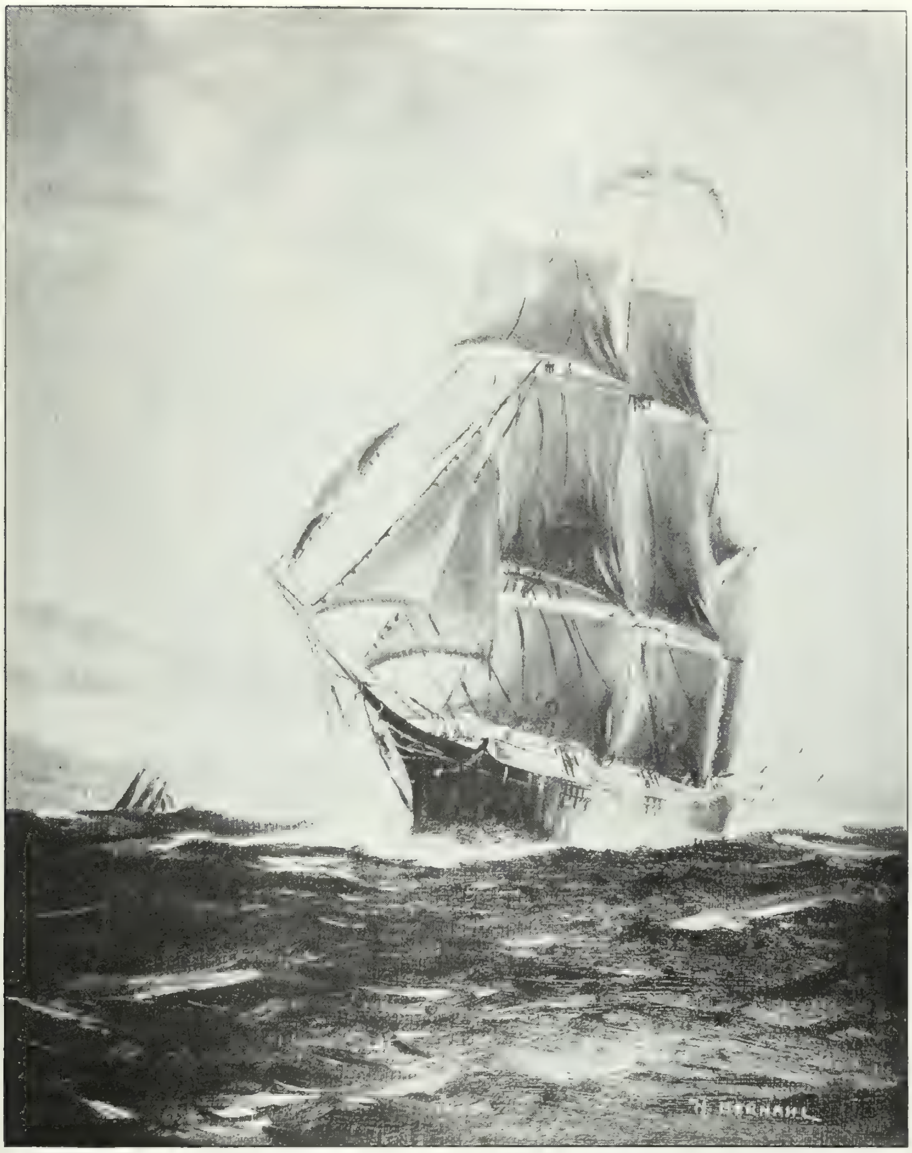
Capacity of the after hold is 150 tons of iced fish.

Her cruising radius is 4000 miles at full speed.

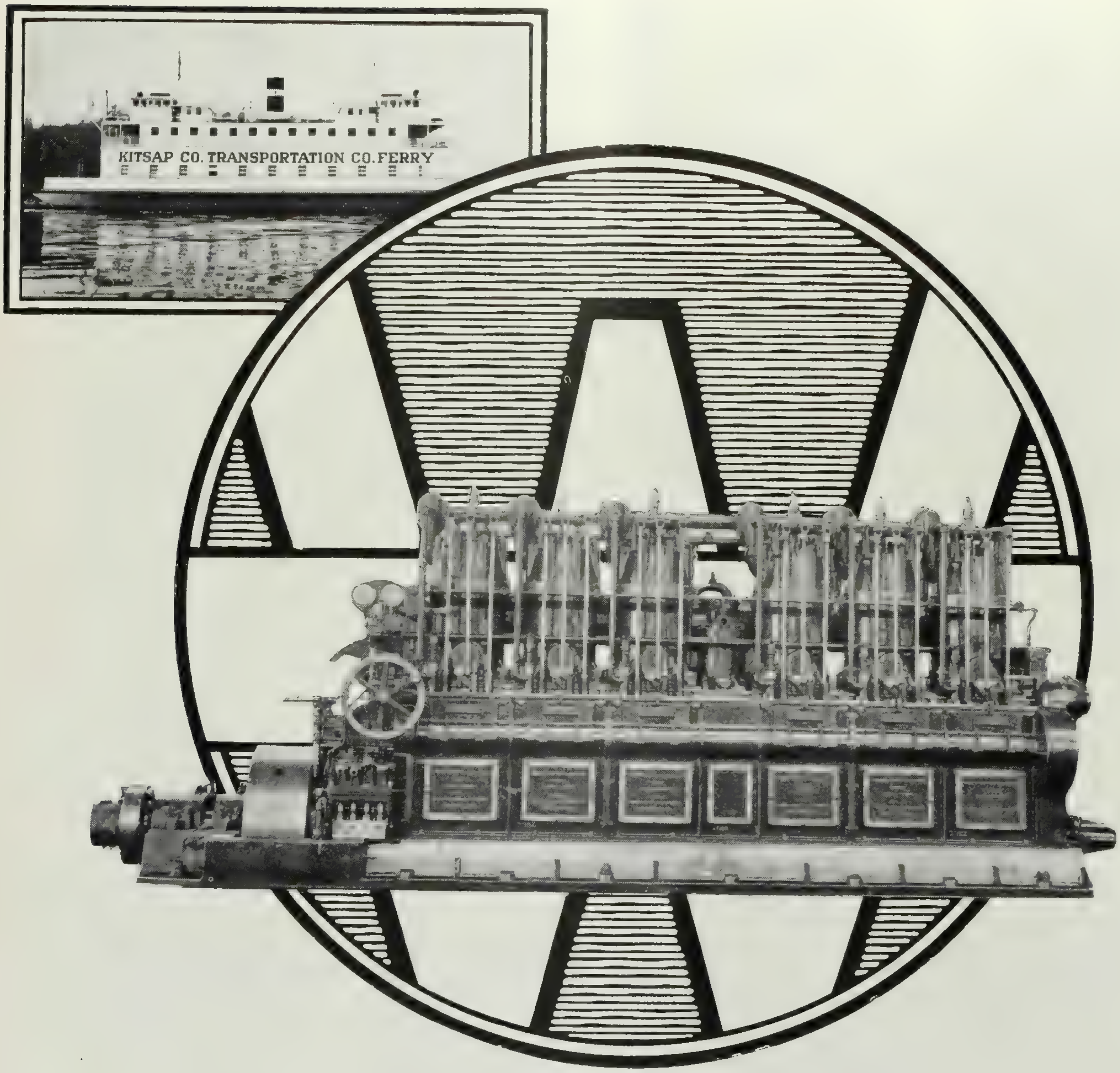
Her auxiliary equipment includes a refrigerating plant, electric light plant, power winches and pumps for circulating sea water through live bait tanks.

Accommodations are provided for two officers and eight men.

UNION GAS ENGINE CO.
OAKLAND, CALIFORNIA, U.S.A.
ESTABLISHED 1885



AMONG the younger members of the artist community at San Francisco Henry Bernahl is showing much promise in his chosen special field of the sea and ships. The spirited painting shown here is his conception of a whaler bark taking in her kites under a stiff breeze.



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The sturdy strength of the Washington Estep Diesel engine enables it to stand up under gruelling service—whether in a work boat or pleasure craft. Its steady, dependable performance, simplicity and accessibility inspires confidence in emergencies.

Made in both Marine and Stationary type from 50 B.H.P. up.

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Yacht Malibu

"WASHINGTON ESTEP" DIESEL ENGINES

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Member of Pacific Traffic Association

Official Organ
Shipowners' Association of the Pacific

James S. Hines,
President and Publisher.

Bernard N. De Rochie,
Vice-Pres. and Manager.

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Alexander J. Dickie
Editor.

Paul Faulkner,
Advertising Manager

Shipbuilders Association Nation Wide

FOR the purpose of bringing together into a compact ethical working unit all of the shipyards and ship repair plants of the United States and providing a medium for greater coordination of thought and expression on problems of mutual interest, the Atlantic Coast Shipbuilders' Association recently invited one of the senior executives of every shipyard and ship repair plant in the country to serve on a committee which will function in legislative matters and in such Association activities that are national in scope and conducted for the benefit of the entire industry. Acceptances were received from 67 shipbuilders and ship repairers, and a committee of that number was formally appointed. The members of the committee will also serve in an advisory capacity to the officers and councillors of the Association.

It is believed that the personnel of this committee will prove invaluable in developing suggestions for the Association's future activities, in furthering its legislative policy, and in bringing about a wider interest in shipbuilding through the various commercial, industrial, and other organizations with which the members are individually identified.

The personnel of the Atlantic Coast Shipbuilders' Association national committee of shipbuilders and ship repairers is as follows:

New England Section.—S. W. Wakeman, vice-president and general manager, Bethlehem Shipbuilding Corp.; S. W. K. Brooks, president, S. W. K. Brooks Co.; Paul J. Bertelsen, general manager, The Atlantic Works; William E. Rice, president, Rice Bros. Corp.; E. A. Morse, president, Noank Shipyard, Inc.; and L. Y. Spear, president, New London Ship and Engine Building Co.

New York Section.—L. H. Korndorff, vice-president and general manager, Federal Shipbuilding & Drydock Co.; John J. Amory, president, Consolidated Shipbuilding Corp.; W. Parker Runyon, president, Perth Amboy Drydock Co.; Henry B. Nevins, president and treasurer, Henry B. Nevins Co.; E. H. Ewertz, general manager, Moore Plant, Bethlehem Shipbuilding Corp.; F. P. Morse, president, Morse Dry Dock & Repair Co.; C. Pliny Brigham, secretary and treasurer, Greenport Basin Construction Co.; Charles Cooper, president, Chelsea Ship Repair Co.; William A. Hall, president, C. M. Lane Life Boat Co.; George Hutchinson, president, Newburgh Shipyards, Inc.; J. A. Dwyer, vice-president and secretary, R. Lenahan Co.; and Foster L. Hawkins, manager, Port Jefferson Shipyard.

Delaware River Section.—H. Birchard Taylor, vice-president, William Cramp and Sons Ship & Engine Building Co.; A. W. Main, naval architect, The Pusey & Jones Co.; Clinton L. Bardo, vice-president, American Brown Boveri Electric Corp.; Robert Haig, vice-president, Sun Shipbuilding & Drydock Co.; W. W. Robinson, president, Mathis Shipyard Co.; C. W. Weaver, general manager, Harlan Plant, Bethlehem Shipbuilding Corp.; and John Baisley, president, John Baisley Iron Works.

Baltimore Section.—James C. Leonard, president, Cambridge Manufacturing Co.; J. Macy Willis, general manager, Baltimore Plant, Bethlehem Shipbuilding Corp.; and Captain J. A. Spilman, president, Maryland Drydock Co.

Southern Section.—Homer L. Ferguson, president and general manager, Newport News Shipbuilding & Drydock Co.; Frank B. Hooper, vice-president, Warwick Machine Co.; A. J. Dyer, president, Nashville Bridge Co.; W. G. Larmour, general manager, Old Dominion Marine Railways Corp.; O. A. Bloxom, president, Southern Shipyard Corp.; George W. Roper, president and treasurer, Norfolk Shipbuilding & Drydock Corp.; J. H. Curtis, president, Gas Engine & Boat Corp.; H. R. Humphreys, president, The Humphreys Railways, Inc.; W. W. Storm, vice-president and general manager, Wilmington Iron Works; E. F. Hamme, Jr., Hamme Marine Railways Co.; C. V. Boykin, vice-president and general manager, Charleston Drydock & Machine Co.; and J. R. Massengale, president, St. Louis & Tennessee River Packet Co.

South Atlantic and Gulf Section.—James C. Merrill, vice-president and general manager, Merrill-Stevens Drydock & Repair Co.; Ernest Kreher, president and general manager, Tampa Shipbuilding & Engineering Co.; J. F. Taylor, president and general manager, Warren Fish Co.; Warren Johnson, president and general manager, Johnson Iron Works; Paul F. Jahncke, vice-president, Jahncke Dry Docks, Inc.; I. H. Aiken, president and general manager, Aiken Tow Boat & Barge Co.; J, H. Langben, president, Galveston Drydock & Construction Co.; David R. Dunlap, president, Alabama Drydock & Shipbuilding Co.; John F. Prigge, vice-president, Todd Shipbuilding & Drydock Co.; and Thomas A. Johnson, president, Bruce Drydock Co.

Pacific Coast Section.—George A. Armes, president, General Engineering & Drydock Co.; C. W. Wiley, chairman of the Board, Todd Dry Docks, Inc.; J. A. Moore, president, The Moore Dry Dock Co.; William Cornfoot, proprietor, Albina Engine & Machine Works; James C. Craig, president, Craig Shipbuilding Co.; L. E. Caverly, vice-president and general manager, Los Angeles Shipbuilding & Drydock Corp.; J. K. Collins, president, Hanlon Drydock & Shipbuilding Co.; J. J. Tynan, vice-president, Union Plant, Bethlehem Shipbuilding Corp.; and A. F. Marion, vice-president, Pacific Coast Engineering Co.

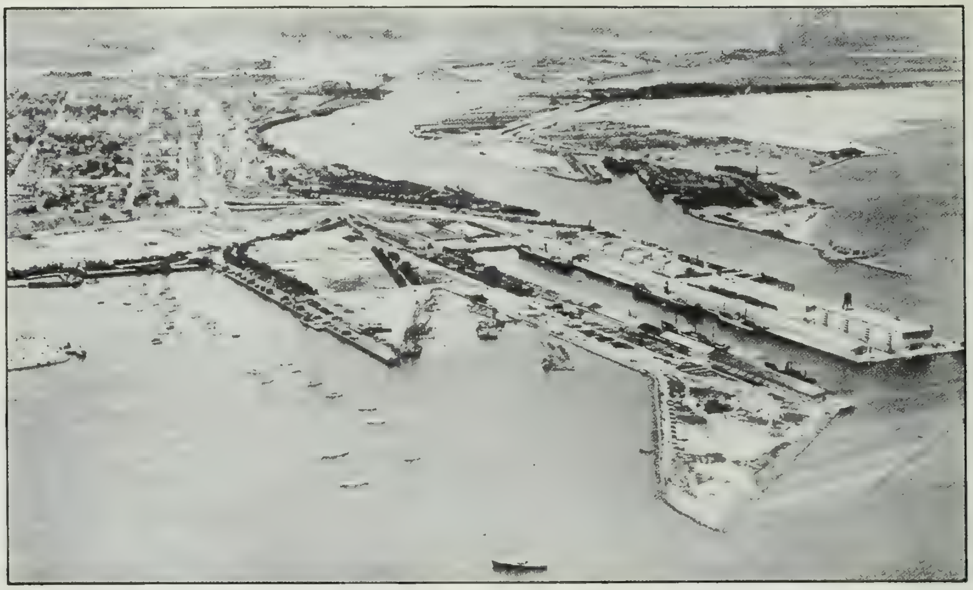
Here and There on the Pacific Coast

A EUROPEAN VISITOR

One of the most interesting features of Pacific Coast maritime commerce is the increasing number of fine new motorships hailing from Europe. Our illustration shows one of the latest of these modern freight carriers, the Danish motorship Tacoma, loading lumber at the port for which she is named. The Tacoma belongs to the Orient Steamship Company of Copenhagen, and was chartered for lumber from Puget Sound to the Orient by the H. R. McMillan Company. She arrived at Tacoma January 14, 1927.

THE PORT OF THE ANGELES

This interesting aerial view shows part of the inner harbor of Los Angeles, California, whose amazing development in the past eight years has elicited the admiration of the shipping world. The southern metropolis of California has every intention of reaching out actively after world trade and of expanding the facilities of its made-to-order port to meet every demand made upon it by the ships of the seven seas. Some excellent research work has been done by the engineering staff at the port, as will be noted by reference to the excellent article appearing on page 64 of this issue.



The illustration above shows three of the long list of nature's gifts in Alaska. At the edge of the Chickaloon River is shown the drilling rig of the Peterson Oil Association. In the middle ground a wonderful stand of paper spruce; and in the background a mountain of coal. Captain Ivan L. Peterson, noted sourdough of the original Alaska gold rush, and well known in shipbuilding circles on the waterfront of San Francisco, has discovered promising oil indications and is being backed up by some of the most influential men on the Pacific Coast. At the right is a close-up of the Peterson drilling rig.

Public Terminals of Seattle

Tonnage Handled over Port of Seattle Piers Shows Huge Increase

By George B. Lamping, President, Port of Seattle Commission

THE total quantity of freight handled at the Port of Seattle public terminals for the year 1925 was 1,243,777 tons. For the year 1926 the total number of tons handled was 1,678,514, an increase of 35.2 per cent over the previous year. The following are a few of the principal commodities making up this huge total for the year 1926:

Commodity	Amount	Value
Silk	171,631 bales	$154,467,000
Canned salmon	2,778,803 cases	25,009,227
Grain	5,259,667 bushels	7,889,500
Eggs, fresh	50,857 cases	610,284
Crushed fruit	32,524 barrels	1,626,200
Fish, fresh	4,946,645 pounds	544,130
Lumber	63,041,679 ft. B.M.	1,576,025
Apples and Pears	1,648,666 boxes	2,472,999
Vegetable oils	13,956 tons	3,269,660
Dry salt herring	13,446 tons	672,300
Molasses	13,757 tons	275,140

The Port of Seattle, a municipal corporation, has been in existence fifteen years and during that time has constructed modern, up-to-date harbor terminal facilities which have been the means of placing Seattle on the world map as regards foreign and domestic commerce.

The terminals that have been constructed are the results of careful planning, first for the upbuilding of the port, second for handling the products of the sea and soil, third as a means of developing the resources of Seattle's hinterland, and the Pacific Northwest.

Among other accomplishments of the Port of Seattle during the brief history of the commission, the following improvements are outstanding: wharves and transit sheds for handling foreign and domestic commerce; grain elevator for handling the wheat and other grains of the Inland Empire; fish freezing and storage plants for chilling and handling fresh fish from Puget Sound and Alaska; warehouses for storing canned salmon and other food commodities; ice manufacturing plant for furnishing ice to fishing boats and for icing railroad cars; cold storage plants for storing perishable cargoes of all kinds, such as fruits, shelled nuts, berries, reindeer meat, eggs, butter, cheese, and the various products of the dairy and farm; equipment and tankage for handling vegetable oils and molasses.

$10,000,000 Spent

The port has expended during the last fifteen years approximately $10,000,000 in developing the existing system of harbor terminals, their present valuation being estimated at $15,000,000. The port is now operating on a self sustaining basis without any tax levy for operating expenses, repairs, replacements, or improvements. The only levy required is that used for partial payment of the interest and retirement of the bonds. The total area of property owned and controlled, including the terminal properties, harbor area in front thereof, and industrial lands, is 133 acres.

Huge Facilities

The total trackage serving the public properties is 15 miles. The total lineal feet of berthing space is 16, 736; total net transit shed storage space, including first and second floors, is 880,000 square feet; total net cold storage space is 178,400 square feet; total dry cold storage warehouse space is 157,510 square feet; total open storage dock space is 889,000 square feet.

New Property

In addition to the existing terminals the Port of Seattle recently purchased from the United States Shipping Board a magnificient site of waterfront property having a frontage on Elliott Bay of approximately 1000 feet between Charles and Connecticut Streets running back from the pierhead line to East Marginal Way about 1200 feet and containing an area of 26 acres. This site is located in the heart of the industrial and wholesale district of the city and will be developed in the near future into a great intercoastal terminal.

Grain Handling Facilities

At the Hanford Street Terminal a bulk grain elevator with a capacity of 1,000,000 bushels is equipped with the latest handling devices for cleaning and handling bulk grain. The port is now expending $100,000 in improving the mechanical handling facilities of this plant and these, when completed, will practically double the output of the elevator. More grain has been shipped from the elevator this season than in any previous year.

The Port of Seattle Public Terminals are administered by a board of three commissioners elected by the city of Seattle for a term of three years. The Board the Port Commission now comprises Colonel George B. Lamping, president; W. S. Lincoln, secretary; George F. Cotterill, commissioner.

The Board owns and controls 10 per cent of the total waterfront of Seattle harbor; 20 per cent is owned by railroads; 70 per cent is privately owned. Of the total linear frontage, 60 per cent is in use and 40 per cent idle and unimproved.

This unimproved property is all deep water frontage and is readily available for the extension of terminal facilities under either private or public administration.

In addition to the salt water frontage on Elliott Bay, there is a long fresh water frontage on Lake Washington, connected to salt water through the Lake Union ship canal.

Seattle, like San Francisco, is almost surrounded by deep water.

Col. Geo. B. Lamping

Bunkering with Richfield

Efficient Facilities at Convenient Locations in California Ports

ONE of the very striking features of modern improvement on the waterfronts of Pacific Coast ports is the gradual replacement of the old unsightly coal bunkering piers, with their grime and dirt, by the neat well-kept oil bunkering terminals with their neatly painted tanks, office buildings, pump houses, and pipe headers. Some of these oil terminals are in their own way very beautiful and by comparison with the old coal horrors shine out as works of engineering art.

Among the younger California organizations for the marketing of petroleum products, the Richfield Oil Company has been paying special attention to the matter of convenient and efficient bunkering of ships. To this end they have acquired strategically located waterfront properties at Los Angeles harbor and on San Francisco Bay and have improved these properties with the very latest modern facilities for the storing of and for the delivering of fuel oil, diesel oil, the lighter distillates of petroleum, and lubricating oils.

To serve these terminals a growing fleet of tankers is required. Starting with the steamer Richfield, having a capacity of 19,600 barrels of oil, the company soon built two shallow draft tankers for bay service, one a tow barge for Los Angeles harbor, the other a self-propelled diesel-electric driven tanker, the Richlube, for use in San Francisco Bay. More recently Richfield purchased from the Shipping Board a larger tank steamer, the Kekoskee. This vessel is 392 feet long, 51 feet beam, 24 feet 3½ inches loaded draft, and carries 40,575 barrels of oil. She has a sea speed of 10½ knots. Towing barges, the Richfield and the Kekoskee are expected to supply the Richfield demand for a time, and as greater quantities of oil are needed, more tankers will be added to the fleet.

MARINE OIL TERMINALS

Views at the top of this page show three of the marine terminals of the Richfield Oil Company.

At left: Richfield marine terminal at the outer harbor, Oakland, California. From this point the Richfield commodities are distributed to all points on the east side and upper end of San Francisco Bay.

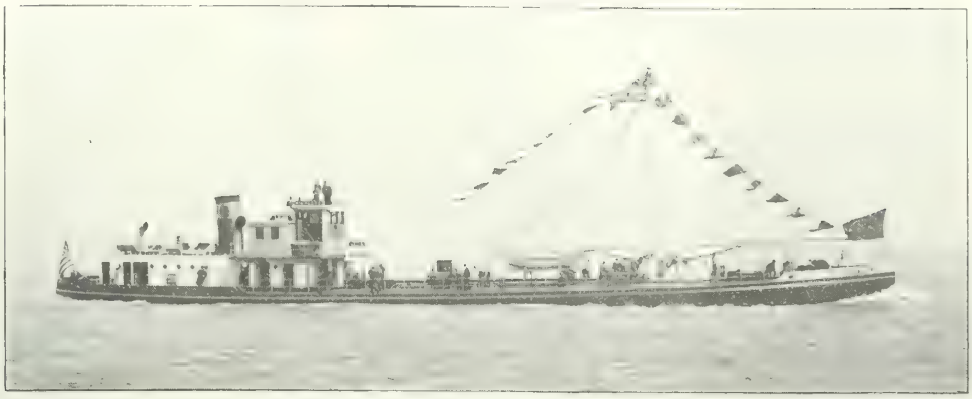
Center: Marine terminal of the Richfield Oil Company at Long Beach, California, showing in the foreground the two oil loading docks and bulk storage tanks.

At right: The distributing terminal of the Richfield Oil Company at South San Francisco. From this point are served customers on the south end of San Francisco Bay and on the San Francisco peninsula.

The genial gentleman whose portrait appears above this caption is Lew L. Collins, manager of marine sales for Richfield Oil in the San Francisco Bay territory.

For bunkering service and for delivery to all points on San Francisco Bay, the Richfield Oil Company established, about a year ago, a modern terminal on the Oakland outer harbor adjacent to the Parr Terminal. As soon as this had been improved, the tank barge Richlube, referred to above, was added to the fleet. This vessel is 150 feet 6 inches long, 32 feet beam, and 14 feet depth, with an oil cargo capacity of 7000 barrels. She is equipped with an Atlas-Imperial Westinghouse diesel-electric power plant of 500 brake horsepower total engine rating and easily makes 9½ knots an hour loaded. Four 6-inch discharge pipes, each fitted with a double hose connection and served by two Northern rotary pumps each driven by a 75-horsepower Westinghouse motor, insure prompt dispatch in bunkering.

The Richlube is much in demand for delivery of bunker oil to the big steamers and motorships alongside the docks on the San Francisco waterfront. This demand has become so great that the Richfield Oil Company has secured a terminal site on the San Francisco side of the harbor at the foot of Leavenworth Street on North Beach. Here one of the most modern oil terminals on the Pacific Coast is rapidly materializing. The location is ideal and should prove very convenient



BAY TANKER

Our illustration shows the diesel-electric shallow draft tanker Richlube, fully loaded, on her trial trip on San Francisco Bay. This vessel, driven by an Atlas-Imperial, Westinghouse diesel-electric power plant, and equipped with Westinghouse motor driven Northern rotary pumps of large capacity, has been giving excellent bunkering service to San Francisco Bay oil burners. The Richlube has a cargo capacity of 7000 barrels of oil.

for serving the seagoing ships at dock, the fishing and work boat fleet and the yachts.

At Long Beach and Los Angeles harbors the same kind of facilities are maintained, differing only in the adaptation of the equipment to the peculiar needs of those ports which differ from San Francisco Bay in that there is much less area of water and the marine business is concentrated on a shorter waterfrontage. Therefore, in place of the self-propelled bay tanker Richlube, a tank barge equipped with gasoline engine driven cargo pumps is employed.

William Chisholm, long and favorably known in Pacific Coast maritime circles, is marine superintendent for Richfield Oil Company and Lew L. Collins is manager of marine sales for the San Francisco Bay territory.

An airplane view of the entrance to the outer harbor of Long Beach, California, showing the tanker Richfield steaming out to sea. The location of the Richfield terminal is on the inner harbor in the background.

BUNKERING THE "PRESIDENTS"

The Richfield Oil Company's bay tanker, Richlube, is here shown delivering fuel oil to the Dollar transPacific liner President Taft, after having filled the bunkers of the Dollar round-the-world liner President Monroe. What a contrast is here presented to the old dirty, long-drawn out process of hoisting coal into a passenger liner, with its consequent wear and tear on the exterior and interior surfaces of the ship and on the temper and morale of the crew.

Radio Communication

Its Development and Present Status in America with Particular Reference to the Photo Radiogram Service

By G. Harold Porter*

Manager, Pacific Division, Radio Corporation of America

G. Harold Porter

RADIO is today a household word and it is almost, if not actually, a household necessity. While the idea of wireless communication was conceived many years ago, it nevertheless remained for Mr. Marconi, the acknowledged father of wireless telegraph service, to present it in a practical manner and render it available for commercial use. Thus radio was born under the less fascinating name of "wireless" about twenty-six years ago, when the Marconi Wireless Telegraph Company of America established one coastal station and equipped a few ships with its apparatus, resulting in communication between ship and shore over a distance of about one hundred miles. This was considered quite an achievement.

In those days science and invention were not making the rapid strides that we have witnessed in the last decade. Wireless was not hailed and universally accepted as was radio in the form as we understand it and enjoy it today. People were more skeptical, and progress, therefore, was necessarily slow. It remained for the catastrophe which befell the ill-fated steamship Republic in 1909, when it collided with the steamship Florida, at which time wireless played its first dramatic role and hurled through the air the distress signal "CQD," which resulted in prompt relief and the saving of 1500 lives before the Republic disappeared from the surface of the sea. This tragic incident brought forcibly to the minds, not alone of the shipping world, but also to the people of the nation, the value and importance of wireless as a life-saving agency. Congress enacted legislation requiring all vessels carrying fifty souls or more a distance of two hundred miles between ports to be equipped with wireless apparatus.

This gave impetus to the struggling industry and materially speeded up progress. The achievements in the marine field but whetted the appetite for greater accomplishments and fired the ambition to span the oceans. Accordingly, the Marconi Wireless Telegraph Company of America established high power stations in Massachusetts, New Jersey, California, and Hawaii.

The entrance of the United States into the great world conflict resulted in the government taking over these stations, and the best brains obtainable, together with funds without stint, were employed in the development of this medium of communication, in order that the United States and its allied interests might obtain the greatest possible degree of efficiency in their communication service. Hence, without restraint of patents or other elements, tremendous progress was made in research and development of the art of radio. In consequence, much that had been anticipated with respect to the vacuum tube were at the close of the Great War proved and demonstrated facts. Various patents were held by various interests, and to make this tremendously valuable feature of the radio art available to the commercial world, it was necessary that the respective interests get together and promote its use. Accordingly, it was through the splendid energy and influence of Owen D. Young that the Radio Corporation of America was founded, and shortly thereafter broadcast, as we understand it today, broke upon the nation with startling revelation.

It is indeed a long jump from the conditions attending the installation on the steamship Philadelphia to the great Leviathan of today, the sea queen under the American flag, if not of the Atlantic Ocean. It was my pleasure to negotiate with the government through the Shipping Board, for the equipment of this vessel with radio apparatus, and we may point to her with just pride in the knowledge that there is no passenger carrying vessel more completely or modernly equipped with radio on any of the seven seas than is the Leviathan. We shall soon point with similar pride to the steamship Malolo as the queen of the Pacific, likewise equipped with vacuum tube transmitting and receiving apparatus of the latest design, as well as radio telephone equipment and the latest model of radio direction finding apparatus.

Further, from the initial start of communication over a distance of one hundred miles, it is noteworthy to cite the recent accomplishment of communication from one of our stations on the Atlantic seaboard with the steamship Carinthia on the high seas off the coast of New Zealand, a distance of 10,000 miles. The communication thus handled direct was in the form of greetings from the Associated Press to the passengers on that vessel, circling the globe. The message was received while they were in the midst of their New Year's celebration, January 1, and their reply marked an unusual incident in that it was received in New York, December 31, due to a time difference of approximately nineteen hours between the points of contact. Hence, strange as it may sound, their reply dated January 1, 1927 was received December 31, 1926. Hundreds of Christmas messages were exchanged directly between our San Francisco coastal station and the Carinthia while en route from Manila to Auckland, an experiment of short wave communication of which more will be heard later on.

In addition to annihilating space and robbing the sea of its isolation, there are many humanitarian services rendered to navigation today through the medium of this art. The radio compass directs the mariner through fog and uncertain positions. Storm signals are broadcasted daily to all ships. In case of illness or accident on board a vessel not carrying a physician, medical aid can be obtained from shore or sister ships without cost. Radio has therefore contributed tremendously to the protection and saving of life at sea.

(*An address before the Foreign Trade Club of California at San Francisco, January 19, 1927.)

Turning to transoceanic communication, which must have a direct appeal to those of you gentlemen engaged in foreign trade, it affords another medium of communication, establishing contact for the exchange of viewpoints, terms, and conditions so essentially necessary in the conduct of your affairs. You may be interested to know that today the United States occupies the undisputed leadership in international communication. Wireless circuits now radiate from this country to England, France, Germany, Norway, Sweden, Holland, Poland, Italy, The Argentine, Brazil, Hawaii, Japan, Java, and French Indo-China, and very shortly we will add to this list the Philippine Islands. As a result of the competition thus offered by radio to cables, the American public is the beneficiary of cheaper rates and better facilities for international communication than it has enjoyed for any period during the past forty years.

The Radio Corporation of America is tremendously interested in placing radio communication upon the highest possible plane of efficiency, and added to the telegraphic communication field has been that of the photoradiogram service. It is today commercially practicable to transmit photographs, facsimile printed matter, drawings, fingerprints, letters of credit, and a multiplicity of other important documents from New York to London across the Atlantic, or from San Francisco to Honolulu over the Pacific. Fashions conceived in Paris are transmitted to London, thence by radio to New York, and from there distributed to our large cities. Perhaps the most striking incident of emergency service was the case of Robert W. Shingle, a well-known resident of Honolulu and business man of San Francisco, who had his nomination papers presented under power of attorney as a candidate for the Hawaiian Senate. On the last day on which papers could be filed, he was informed that his personal signature would be required. Mail or even airplane service would not suffice. He therefore transmitted his signature to Honolulu by photoradio service. It was filed and accepted within thirty minutes after transmission, and it is gratifying to relate that Mr. Shingle was handsomely elected.

This service offers particular attraction where time is the essence of an important transaction. Coupled with the varied samples of matters transmitted and received by photoradio, which are here displayed, is a chart showing the possibility of saving from four to twelve days, according to sailing dates, through transmission by photoradio from San Francisco to Honolulu and by mail from there to the Orient. The possibilities of this service are just unfolding, and like the achievement of transmitting the voice by radio telephone from New York to London, which was accomplished commercially Friday last (January 7, 1927), it needs only to be utilized to insure its expansion and to curtail its cost.

In conclusion, let us refer to radio as an industry and note its progress. Approximately five years ago the total sales in the United States were about $1,000,000, whereas in the year 1926 just closed sales approximated, if not exceeded, $500,000,000, thus giving the radio industry rank with the leading industries of the world. Broadcast is being developed upon a high plane and will be made to serve the best interests of the listening public; and yet the potential possibilities of radio are only peeping over the horizon. Dr. Alexanderson, chief consulting engineer of the Radio Corporation of America, informs us that television, which is already an accomplished fact and now in process of refinement, will be so extended that within ten years we shall be able to see people in Europe while we converse with them through the medium of radio; and the end is not yet.

Increasing Aids to Navigation

MORE than a thousand new aids to navigation were installed by the United States Lighthouse Service during the fiscal year which ended June 30 last, according to George R. Putnam, Commissioner of Lighthouses, in his annual report made public recently. During the same period, the report shows, about 750 aids were discontinued. The total number of navigation aids at the end of the fiscal year was 18,130, including 6460 lighted aids, 1239 fog signals, and 10,718 unlighted aids.

Many improvements to navigation were made during the last fiscal year. Among the most important were the changing of 77 fixed lights to flashing or occulting; the changing of the illuminant of 10 lights to incandescent oil vapor, 76 lights to acetylene, and 16 to electric incandescent; the establishment of 12 radio beacons, and the installation of three gas-operated fog signals at light stations and on buoys.

The most important lighthouse construction during the past fiscal year was the work on the light and fog signal station at Cape Spencer, Alaska, which is now nearly completed; the construction of a lighthouse to replace the lightship at Martin Reef in the northern part of Lake Huron, work on the station at Milwaukee Breakwater, and the completion of the new station at Point Vicente, California.

The installation of radio beacons for protection of navigation in fog was extended by the addition of 12 new stations, the total number of which is now 28. During the year automatic lighting apparatus was installed at 83 stations. There are now almost 1100 of these automatic lights on fixed structures and 751 buoys similarly equipped.

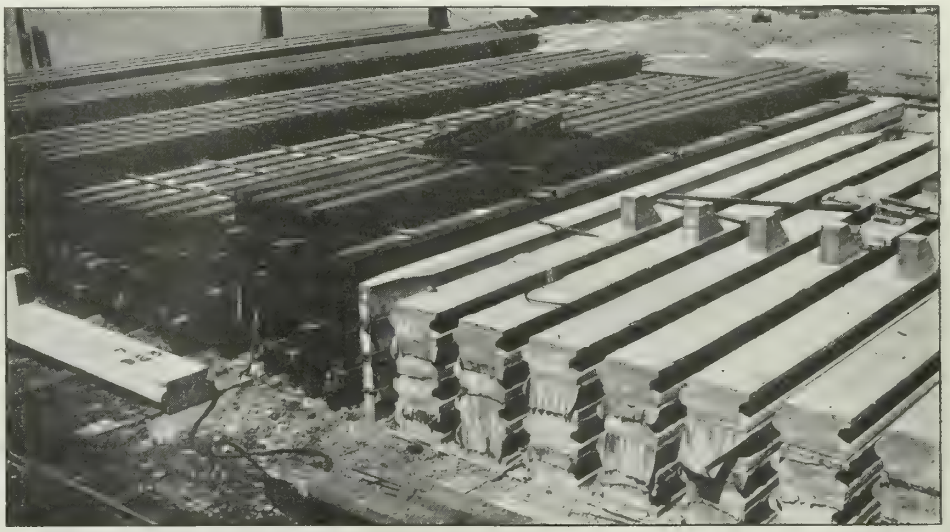
Improvements have been made in apparatus used in connection with electric illumination of light stations. These include an acetylene stand-by equipment to be turned on automatically in case of failure of the electric light. A special electric lamp for use in connection with flash panel lenses is being developed, the primary object being an increase in the duration of the flash and a better arrangement of the light source.

The Lighthouse Service is cooperating with other bureaus of the Department of Commerce in connection with marking and lighting airways. One development in this connection of interest was the painting of the roofs of the lighthouses over Chesapeake Bay with characteristic marks.

The total cost of operation of the Lighthouse Service during the past fiscal year was $9,538,390, of which light stations accounted for 38.3 per cent, lightships for 13.8 per cent, and tenders for 29.8 per cent. The total appropriations for the maintenance of the service for the present fiscal year are $10,154,481, an increase of $346,501 over the fiscal year 1925-26. The appropriations for special works for the present year amount to $834,601, including $350,000 for vessels.

Deterioration of Concrete in Sea Water and Preventative Methods

By George F. Nicholson, Harbor Engineer, Los Angeles*



Untreated concrete sheet piling and asphalt-treated concrete-bearing piling at the Los Angeles harbor piling plant.

SINCE the most important unit of a waterfront terminal facility is the foundation supporting the wharf and superstructure, it is essential that great care be exercised and all determining factors thoroughly analyzed before selecting the proper type of foundation for these facilities.

Throughout the ports of the world, the following four rather distinct types of concrete foundations prevail in the construction of terminal wharf facilities:

(1) Solid fill retaining wall type of construction: This type consists of a retaining wall of mass or reinforced concrete, and in some cases caisson construction, just inside of a protective fender system, with a solid fill behind. This type of construction has been used in a great many of the European ports, but is rarely used in the ports of North and South America.

(2) Concrete cylinder type of construction: This type consists of concrete cylinders of large diameter, founded on rock or timber piling and filled with concrete, which support the wharf floor system. Usually in quay wharf design the bulkhead retaining wall is placed somewhat closer to the face of the wharf in this type of construction than when precast concrete piling are employed.

(3) Precast concrete piling type of construction: This type consists essentially of precast concrete piling, or jacketed piling over a rip-rapped slope, supporting the wharf floor system from the face of the wharf to the bulkhead line.

(4) Concrete piling foundations under shed with creosoted timber bearing piling supporting the apron wharf: This type of construction is practically the same as described in item 3, with the exception that creosoted timber construction is used from the water side building line of the transit shed to the face of the wharf.

Adhering to the policy of using a permanent type of foundation under the concrete floor system and transit shed, the Los Angeles Board of Harbor Commissioners have adopted concrete precast piling from the bulkhead line extending to the slip side building line of the shed, and the creosoted piling type of construction from this point to the face of the wharf. The reason the concrete type of construction is not used under and in the apron wharf is to give as much elasticity to the wharf as possible, thus providing for the absorption of shocks from vessels berthing, and at the same time, lessen the construction cost of the entire terminal. The repair or replacement of the timber-constructed apron wharf is, comparatively speaking, a simple operation, as this work can be done with a water pile driver and without interference with the concrete floor system or shed structure. This design has been followed at Los Angeles Harbor since the establishment of the harbor by that city, with few exceptions such as in the building of oil and lumber wharves. The writer is convinced that the Los Angeles Board of Harbor Commissioners and former engineering department formulated a very wise policy in the adoption of this design of terminal structure.

Causes of Deterioration

The average layman, in fact a great many engineers not familiar with the subject, are of the opinion that well constructed concrete is practically permanent in sea water. However, recent disclosures of serious deterioration in scientifically made concrete exposed to sea water prove this theory fallacious. Although deterioration of concrete in salt water is, to a considerable extent, the result of mechanical effects, such as wave action, abrasion from floating debris and ice, and conditions arising from freezing weather in colder climates, yet the two chief causes of failure of concrete in sea water, which most investigators have practically agreed upon, are as follows:

(1) Chemical action of sea water on concrete: The most active disintegrating element in sea water is magnesium sulphate, which combines with the free lime in Portland cement, this content varying from 15 to 30 percent. This chemical action leaves a deposit of calcium sulphate crystals which occupy approximately 1.4 times the volume occupied by the lime, resulting in the expansion and decomposition of the concrete. In addition, even if there is a slight movement of water in the body of the structure after the removal of the free lime, the dry calcium silicate, which is the mostly quickly formed product in the setting of the concrete, is broken down and this process once commenced continues until the concrete is reduced to a disintegrated mass of sand and other aggregate.

(2) Oxidation of reinforcement: Reinforced concrete breaks down not only from effects attributable to chemical and external mechanical causes, but as a result of corrosion of the reinforcing steel. The steel is slowly fed oxygen by the circulation of water from the section of the pile submerged, water being drawn up into the pile by capillary attraction to the portion exposed to the air, where the water is constantly evaporated. This action is continuous and finally results in the corrosion and expansion of the steel, causing spalling and splitting of the concrete, and this, in turn, further accelerates corrosion. The under sides of the slabs and beams are affected in a like manner, although to a lesser degree, by salt water spray and heavy fogs. There are other contributing factors which may influence this type of failure, the chief being electrolysis.

Illustrations of Deterioration.

The extent of the effects of disintegration of concrete in sea water is not generally understood in North America as, until recent years, concrete has not been used extensively on this continent.

There are instances, however, where concrete has been used for a number of years in sea water in North American ports, particularly on the Pacific Coast. For instance, San Francisco has used concrete on terminal facilities for over twenty years; in Puget Sound concrete has been used in the U. S. Navy wharves in Bremerton and in the Lake Washington canal locks in Seattle, the age of the reinforced concrete in these structures being approximately seventeen years, while some of the mass concrete is thirty years old. Los Angeles has been using reinforced concrete for approximately fourteen years.

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*Paper read before the 1926 Annual Convention of Pacific Coast Association of Port Authorities at Portland.

Marked deterioration has developed in concrete used in the Pacific Coast ports which have built structures of this material. Disintegration evidently began a short time after the concrete was placed, and although the progress was apparently slow for the first few years, yet there appears to have been a more rapid advance in the rate of decomposition after the age of approximately seven or eight years was attained.

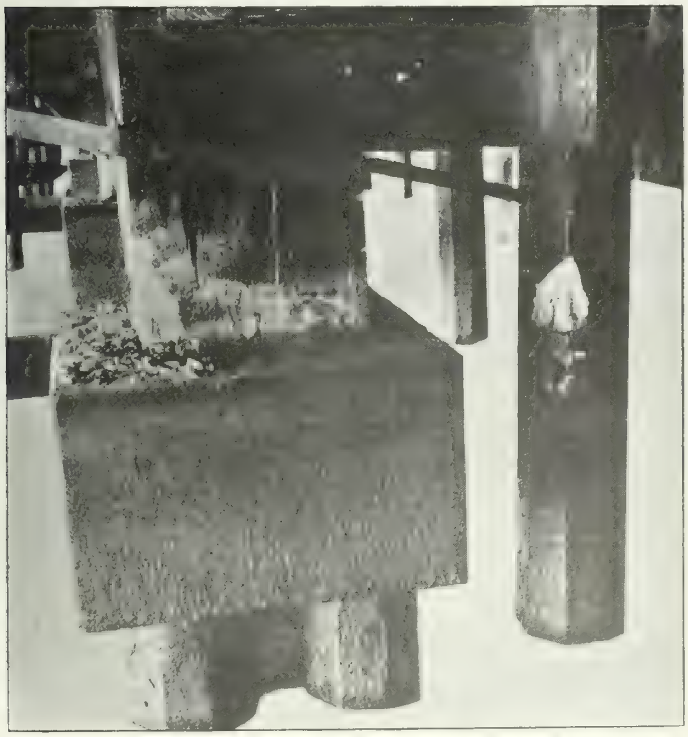
In this connection it should be stated that this deterioration takes place chiefly between the extreme low water line and the top of the piling, and on the under side of the concrete floor system and concrete beams. The salt spray, heavy fog, and salt-laden air appear to be the causes contributing to deterioration above the high water line.

In Seattle, the municipal port authorities have not used the concrete type of construction in the building of their facilities, but adopted the policy of using creosoted wooden piling and timber construction on account of the relative cheapness of this material in the Pacific Northwest. However, some of the private concerns and the United States Government departments located on Puget Sound have used both reinforced and mass concrete in terminal wharf facilities and in the Lake Washington canal locks. The mass concrete structures are, in some cases, thirty years old and are only in fair condition while the reinforced concrete of seventeen years of age in sea water shows various stages of disintregation.

In San Francisco, considerable deterioration has been noted in the concrete cylinders, plain precast concrete piling, and in the under surfaces of the floor slabs and beams. This work has been under repair in recent years.

In southern California, a number of reinforced concrete pleasure piers have failed after a relatively short period of service, but it is recognized that the material and workmanship in most of these cases were not of the best.

In Los Angeles harbor, plain precast concrete piling, both untreated and painted, and also the same type of piling containing different admixtures and compounds for producing as dense a concrete as possible, have shown a serious deterioration. This deterioration was noticeable at the age of approximately eight years, but has progressed much more rapidly during the past three to five years, some of the concrete piling being eleven years in place, while others have seen fourteen years of service.



View of column footing under pier at Los Angeles harbor showing deterioration.

Plain precast concrete piles driven in Municipal Pier No. 1, Berths 56-60, in the year 1915 were made of a dense concrete mixture, proportions of 1:1½:3, and were, without doubt, as strong and as dense a precast concrete pile as could be manufactured today. They were scientifically made from every standpoint, and great care was exercised both in the manufacture and driving of them. Each pile was inspected by a diver following the installation and in case of fracture, the pile was replaced. Most of these piles were painted with two heavy coats of one of the best waterproofing paints and a percentage of them contained waterproofing compounds for experimental purposes. Neither the painting, the admixtures used, nor the oil residue that collects on the piling in Los Angeles Harbor, served to have any effect in retarding the progress of decomposition. The painted piles as well as the piles containing the admixtures seem to deteriorate as rapidly as the untreated or plain concrete piles.

A very large percentage of the bearing piles and practically all of the column footings, have deteriorated to such an extent that the steel is exposed in a great many places, with attendant corrosion, causing spalling of the concrete. In some locations, sections as large as eight square feet have been affected, and the decomposition has, in instances, penetrated a considerable distance inside the steel line. A number of places in the hammerhead wall supporting the sheet piling also show evidence of deterioration, and there are spots in the under side of floor slabs and beams that show slight deterioration. This section of the structure is, however, in very much better condition than the bearing piles and column footings. Where this deterioration has taken place, the steel hooping has rusted out entirely and the heavy vertical reinforcing bars have rusted and scaled off, reducing the area of the steel in the concrete considrably. This is a typical example of the deterioration which occurs in piling made of dense concrete in a short period of time, in spite of the inclusion of admixtures to reduce the absorption to a minimum and regardless of protective coatings of paint applied before installation. Moreover, the piling in question had the advantage of being heavily coated with oil from waters of the harbor.

In the repair of these pilings, all damaged or deteriorated concrete will be removed and slight excavations will be made into the sound concrete to provide anchorage for the new work. The reinforcing steel will be scaled and all rust removed with a sand blasting machine. The destroyed area of piling will then be built up by means of a cement gun, bringing the outer edge of the patch approximately an inch beyond the original surface of the pile. While this method of repair is expensive, nevertheless it is considered the most satisfactory. It cannot be hoped, however, to obtain even nearly as good a bond between the patch and the old concrete as the bond obtained in the original poured pile. It is reasonable, therefore, to expect further deterioration of the piling, with the passage of time, in the immediate vicinity of the new work; also decomposition will surely continue in other sections of the pile that have not as yet shown any evidence of deterioration.

Plain precast piles driven fourteen years ago in the Watchorn Basin and under the facilities of the Outer Harbor Dock & Warehouse Co. have practically failed entirely and creosoted piles have been driven in the bents to support the structures above. These piles, however, were not as dense and as scientifically made as the Pier No. 1 piles referred to in the foregoing. Other precast piles and Gunite piles in the harbor are only from a year and a half to five years old and, therefore, are not of sufficient age to disclose much evidence of deterioration. Some evidence of decomposition, however, has already appeared in the oldest Gunite piles which were installed approximately five years ago. It would seem quite logical to presume, therefore, that all of the plain untreated precast piles will show deterioration similar to that which has appeared in the cases cited. These results indicate the need of pressure treating piling with asphalt or other agents to thoroughly seal the pores of the concrete for an adequate distance in from the surface of the pile.

E. C. Earle, assistant harbor engineer for Los Angeles, who for several years occupied the position of vice chairman and chief engineer for the Manila Harbor Board, states that in his examination of concrete structures in sea water in the Philippine and Hawaiian Islands and Oriental ports, a marked deterioration is present in these terminal facilities.

The statement is often made that European ports have been very successful in the use of concrete in sea water and that practically no deterioration has resulted. The writer spent eight months in Europe in 1922 and during that time made an inspection of all the principal European ports. Being particularly interested in the condition of both mass and reinforced concrete, a close inspection was made of facilities constructed of this material, and, generally speaking, in the case of structures similar to those built in North American ports, of mass and reinforced concrete, approximately the same deterioration as exists in our structures on the Pacific Coast was noted. However, as a very large percentage of the concrete work in Europe is of the mass type, with little or no reinforcing, and as the deterioration in these mass structures is not as noticeable as in the smaller dimensioned reinforced concrete, the general opinion prevails that the port authorities of Europe have been more successful in this direction.

Solid Fill as a Solution

Some terminal engineers have advocated the solid fill retaining wall type of construction instead of the open concrete pile construction on account of the decreased maintenance cost and reduced opportunity of disintegration. However, there are so many disadvantages to this old European system that it is questionable whether this form of construction will ever be used to any extent in the newer ports in North America, except in some isolated cases where a rock or very solid foundation exists. The disadvantages may be summed up as follows:

(1) **High Initial Cost:** On account of the initial cost being very high, it would be impossible to realize even a small percentage of the interest on the investment from the operation of such a facility. (2) **Limitation of water depth alongside facility:** Once installed, the retaining wall at the face of the wharf limits the depth of water in the channel or slip alongside. Numerous ports in Europe have undermined their retaining walls in attempting to dredge a few more feet to meet present day conditions. (3) **Deterioration of retaining wall:** Deterioration of concrete in retaining walls takes place, although to a lesser degree than in reinforced precast piling. This disintegration is very noticeable in most European ports except where the walls have been faced with solid granite.

The best evidence that the open type of pile construction is deemed superior to the solid fill retaining wall type is the fact that a number of the newer and, in some cases, the older established European ports have adopted or changed their design to the open type of pile construction.

Concrete Cylinder as a Solution

The concrete cylinder type of construction has been mentioned as a possible solution of the problem, the reasons advanced being that the reinforcement can be placed at a considerable distance from the surface of the cylinder and that the thick protective coating of concrete outside the steel would practically prevent corrosion. It has also been argued that if deterioration of the concrete does take place, this deterioration would be very slow, and the life of the cylinders would not be materially reduced.

The same disadvantages referred to, in connection with the comparison of the solid fill retaining wall type of construction, obtain in concrete cylinder type of construction.

Painting Below High Water

The suggestion that untreated precast concrete piling be painted in place, from time to time, has been offered as a remedy for the prevention of deterioration.

Mr. Coover, superintendent of construction and maintenance, Los Angeles Harbor Department, has, on numerous occasions, attempted to paint piling below the high water line with a spray gun, using a special asphalt protective paint, but on account of the wetness and oil spots encountered, it was found absolutely impossible to obtain satisfactory results and this plan was therefore abandoned. Assuming, however, that paint could be made to adhere more or less satisfactorily to the pile, nevertheless it would be impossible to obtain a perfect bond between the paint and concrete, and this defect, together with the air pores prevalent in the film of paint, would permit the infiltration of salt water into the pile. That this action does obtain has been amply demonstrated in the Pier No. 1 piles, heretofore referred to, where these piles, which were efficiently painted before installation, deteriorated in the same degree as the unpainted piling.

Pressure Treating With Asphalt

A considerable amount of experimental work has been conducted in Los Angeles Harbor during the past few years, with the view of producing an adequately protected pile that would have great length of life. The lean concrete pile, fully impregnated with asphalt and commonly known as the Duocrete pile, a patented product, was one of the first results of research in this direction. A number of these piles have been used in the past in the public terminal facilities, as well as private wharf facilities in Los Angeles Harbor, but not in the past two years.

The criticism directed against the Duocrete pile has been that it was made of a lean and therefore porous mixture, to insure full asphalt penetration, and that in the treatment at high temperatures at least part of the water of combination was driven off, thus resulting in a weaker concrete. The present harbor board and engineering department believe this criticism fully justified.

Extensive laboratory and field tests of concrete have also been conducted over a long period of time by the Los Angeles Harbor Engineering Department. Considerable pertinent and valuable information has been obtained from these tests, thus permitting of betterment in design and in the drafting of new piling specifications.

After a thorough examination of the deteriorated concrete piling in this and other harbors and an analysis of the proposals submitted for piling to be used in the new terminal facility, Berths 228 D & E, now under construction, it was finally decided to adopt a new type of piling combining both strength and permanence by providing for a dense concrete insuring a pile of maximum strength and, in addition, to treat the piling under pressure at low temperatures, forcing in sufficient asphalt to penetrate to a depth of approximately 1½ inches, thus filling all of the pores in the outer section and eliminating the possibility of sea water entering the pile at all.

The impression has prevailed that the above process is a patented method. It should be definitely stated at this time that this treating process is not patentable. In fact, an application was submitted recently to the United States Patent Office and was denied. It is a method very similar to the creosoted timber pile treating process, which is not patentable.

The different stages of pile manufacture and treatment, as provided in the Los Angeles Harbor Department revised specifications, are as follow:

(1) A concrete mixture of 1:1½:3 is poured into horizontal wooden forms.

(2) A slightly drier mixture is used in outer 2-inch rim of the pile, from a point three feet below the low water line to the top of the pile. This is accomplished by the use of steel plates, which are lifted during the pouring of the concrete.

(3) Pneumatic hammers are used on the sides and top of forms to produce a vibratory action in the concrete, thus producing a dense mixture.

(4) The tiering of piling under construction is restricted to three tiers.

(5) Concrete piling is cured for a minimum period of sixty days, and on account of progress of treatment, some piles are cured for as long a period as 130 days.

(6) Piles are then placed in air preheater for twelve hours at a temperature ranging from 100 degrees to a maximum of 180 degrees Fahrenheit. Free water is driven off in this process.

(7) Piles removed to asphalt treating chamber.

(8) Twenty-three inch vacuum maintained in treating chamber for two hours.

Asphalt treating plant for treating precast concrete piling, Los Angeles harbor.

(9) Asphalt admitted to treating chamber at temperature of 180 degrees Fahrenheit and increased to a maximum of 250 degrees Fahrenheit.

(10) Pressure of 150 pounds per square inch applied for eight hours.

(11) Asphalt and concrete piling removed from treating chamber, piling being permitted to cool naturally.

It will be noted from the above that some deviations have been made from previous specifications for asphalt treated concrete piling. A very dense concrete is produced by a rich mixture and the use of pneumatic hammers. Tiering of piling is restricted, and the period of curing has been increased from a minimum of thirty to a minimum of sixty days. The maximum temperature in the pre-heater has been reduced to 180 degrees Fahrenheit and the asphalt temperature in treating chamber has been reduced from 500 degrees Fahrenheit to a maximum of 250 degrees Fahrenheit. Moreover, the piling are finally cooled very gradually.

An analysis of the many official heat tests that have been conducted on concrete and a review of the opinions of the best authorities on this subject disclose the fact that dehydration begins at approximately 500 degrees Fahrenheit and that, until that temperature is reached, the water of combination is not driven off and no injury results. Therefore, our limit of 250 degrees falls well within the limit of safety.

Tests of the pressure treated piling now being manufactured show exceptional strength and have surpassed all expectations. This is chiefly due to the rich mixture used, to careful tamping, and to the use of pneumatic hammers, resulting in a very dense concrete. A summary of average and maximum compressive strength for normal and treated concrete specimens tested to date is shown in table.

Normal Concrete

Average Compressive Strength		Maximum Compressive Strength	
Age	Lbs. per Sq. Inch	Age	Lbs. per Sq. Inch
28 days	4185	28 days	5570
60 "	5025	60 "	6240
100 "	5300	100 "	7100

Treated Concrete

Average Compressive Strength	Maximum Compressive Strength
4865 pounds per sq. in.	6070 pounds per sq. in.

Note: Treated specimens vary in age from 60 to 100 days, the average age being 80 days.

Strength and Durability in Sea Water

The designed load for concrete piling used in Los Angeles Harbor is approximately 30 tons per pile; the actual dead load being 7 tons and the live load 23 tons, making a total actual full load of 30 tons. A factor of safety of four is used, bringing the ultimate load to approximately 120 tons. As a matter of fact, reinforced concrete piling, as designed and specified by the engineering department, will sustain a load of probably 150 tons before failure. Considering the actual load of thirty tons, the matter of reduction of a few pounds per square inch in compressive strength is not a vital factor as compared to the permanency of the piling. Recently a load test was conducted at Berth 228 D & E in Los Angeles Harbor, and 83 tons were used, all the weight that could possibly be placed on the platform of the test pile made under our recent specifications. This test proved that there was no settlement at the designed load of 30 tons and there was no sign of fracture of the pile under the test load of 83 tons.

Therefore, concrete piling should, of course, be made as strong as possible, but at the same time sufficient allowance should be made for waterproofing at least the exterior rim of the pile to insure long life and to guard against decomposition. It is contended that plain precast piling without protection, or even if painted with several coats of the best waterproofing paint, is by far a more expensive pile over a long term of years.

As elsewhere herein explained, the Los Angeles recent pressure treated precast concrete piling specifications provide for the manufacture of the strongest possible pile, under present day approved methods. At the same time, a protective coating of asphalt in the outer rim of the pile to a penetration depth of approximately 1½ inches is provided. This design then combines both strength and permanency.

Concrete or Creosoted Timber

Considering asphalt treated concrete piling, it can be shown from an analysis of costs and the prospective length of life, that this type of concrete piling under the concrete floor system and transit shed is more economical over a period of years than the creosoted timber piling.

Creosoted wooden piling has an approximate average life of about twenty years. The initial cost of the asphalt pressure treated concrete piling in place is approximately 2½ times the original cost of the creosoted timber piling installed. The length of life of the concrete piling treated with asphalt to prevent deterioration we expect to be practically permanent in sea water, but even presuming the very conservative figure of forty years, or double the life of the creosoted timber piling, the asphalt treated concrete piling figures more economical, especially when the following increased costs and disadvantages attending the use of creosoted piling are taken into account:

(1) Replacement of creosoted timber piling at the end of approximately twenty years at a cost at least equal to the original investment, plus the cost of wrecking and replacement of a large portion of the floor system to permit the redriving of the piling. If floor system be of reinforced concrete, then the latter increasing cost is material.

(2) Increased damage to creosoted piling under shed due to placing and maintaining larger amount of rip-rap rock on the upper section of slope under facility.

(3) Poor design, due to insecure connection between creosoted wooden piling and concrete beam and deck system, if latter floor system is used.

(4) Non-use of wharf and transit shed for handling cargo during reconstruction period and resultant loss of revenue therefrom.

(5) Increased fire risk of timber construction.

(6) Increased insurance.

The writer concludes after much observation and study of the situation that serious deterioration of concrete piling will be experienced by ports using piling in their terminal structures in sea water unless some form of pressure treatment with a preservative agent is utilized to seal the pores of concrete thus preventing the chemical action on concrete and the oxidation of the reinforcing steel.

Everett Harbor

A Typical Puget Sound Lumber Port

By M. B. Ames.

View of the harbor at Everett, Washington.

EVERETT is the port of call for much shipping; steamers, foreign and domestic, load and unload at her docks. The shipping of lumber from the mills constitutes most of the business of the port.

Within the past year the Associated Oil Company has built a new plant on the old flouring mill site, with a gas distributing point consisting of a garage and warehouse, as well as several additional smaller buildings.

Captain Harry Ramwell, president of the American Packing Company, vice-president and manager of the American Tugboat Company and of the Everett Sand & Gravel Company, assisted by R. Lawrence Beaulieu, civil engineer, one of the most technical men on the Coast, has done more in past years for the improvement of Everett waterfront than anyone else. Mr. Ramwell has recently taken over a cold storage plant belonging to the Everett Ice Company and has added a third story to the brick building, doubling its storage capacity, and is doing such general remodeling of the buildings to insure the city one of the most efficient plants of the sort in the Pacific Northwest.

A quiet day on Puget Sound.

Weyerhaeuser Timber Company, Mill A, owns a big dock at Mukilteo pier with berthing space for four ships. This dock was extended five hundred feet a year ago.

Pier 1, the Everett Dock & Warehouse Company, has a capacity for two ocean going ships.

Pier 1½ is a small dock belonging to the Pacific Tugboat Company. This pier is under lease to the port of Everett.

Pier 2, belonging to the Washington City Dock Company, has a capacity for four ocean going ships. While this dock is used for general purposes, it is a ferry dock from which the passenger business plys to and from Whidby and other islands. North of this are the distributing companies for petroleum. The Standard Oil Company also owns a dock of generous dimensions in this district.

A small bond issue has been authorized for the purchase of a strip of land between Piers 1 and 2 to be used for additional waterfront purposes. Plans are not entirely worked out, but the idea is to improve for the use of small steamers plying between Everett, Seattle, and other neighboring towns.

Clark-Nickerson Company has a dock which will accommodate two small steam schooners only. Large ships are excluded.

Everett Harbor supports eight docks. W. Nierhoff owns terminal facilities adjacent to the port of Everett, between Mukilteo and Columbia Beach on Whidby Island. Mr. Nierhoff has recently built at Austen, in Mutiny Bay, a 400-foot dock, and contemplates a run from this dock to Port Ludlow, connecting up that road.

The American Tugboat Company operates a powerful commercial wireless station at Pier 3, from which ships may be spoken off the coast of Japan.

(Port Section Continued on Page 71, Ad. Section)

How Our British Friends Do It

By Norman F. Titus, Chief, Transportation Division, Bureau of Foreign and Domestic Commerce.

ONE of the greatest issues before the American people is the solution of our merchant marine problem.

The Shipping Board has been engaged, during the past six months, in making an exhaustive study of this subject, reporting their findings to the Senate on January 12, 1927. As a preliminary to this study, the Shipping Board held regional hearings throughout the United States and their reports indicate that they found a practically unanimous demand for an American merchant marine; furthermore, that approximately 95 per cent of those in attendance at the meetings were in favor of private, as opposed to government, operation. In addition, they found a practically unanimous opinion that some form of government aid should be extended to our merchant ships to overcome the operating differential, as compared with foreign vessels, under which they are laboring.

This disadvantage arises both from legislative requirements and restrictions, and from higher capital charges, which, in the main, have their genesis in commendable causes—better wages and better conditions for American labor. Many analyses have been made of our shipping problem and, unquestionably, much time will be spent in forthcoming sessions of Congress in debating upon this most difficult subject.

In a situation such as this, it is always the part of wisdom to examine what others have done, to see if anything can be gained from their experience. In this respect, we find that our British friends have worked out the details of shipping in a highly successful manner and while, of course, many of their conditions are different from those prevailing in the United States, nevertheless it may prove of interest to examine their method of conducting the shipping business to ascertain if there is anything that they have accomplished that will throw light upon our problem.

Chamber of Shipping

In reviewing British shipping, we find first of all that they seem to be more thoroughly organized than we are. Probably this organization is best typified by the Chamber of Shipping of the United Kingdom. This Chamber was organized in 1878 and is now representative of the entire industry. Its Annual Report of 1925-26 discloses that its membership includes sixteen local shipowner societies, seven defense clubs, eleven protection and indemnity clubs, four associations of shipowners on special routes, and a large number of shipowner groups. Probably the most outstanding of the latter class of membership is the following:

Peninsular & Oriental group	2,213,829 tons
Royal Mail group	1,959,185 "
Furness Withy group	393,870 "
Houlder Bros. group	186,811 "
Ellerman group	350,792 "
British Tanker Co., Ltd.	368,892 "
Clan Line	275,847 "
Canadian Pacific Steamships, Ltd.	362,288 "

Adding to the tonnage of the large ship owners just mentioned, the tonnage of the five smaller companies which make up the entire shipowners' group, we find that the total tonnage for this class of membership is 6,589,759. When the tonnage of the Protecting and Indemnity clubs is added, the total enrollment in the Chamber of Shipping in 14,283,463 tons of shipping.

The work carried on by the Chamber is fully disclosed by the number and activity of its committees. In its annual report, nineteen full pages are devoted merely to listing the members of the committees of this vigorous organization. A glance at these nineteen pages shows even a casual observer that the Chamber has in mind two great principles in creating its working committees. These principles are the initiation of policies for the betterment of British shipping and the coordination of all world agencies which contribute indirectly to the strengthening of the shipping industry. Let us see how the Chamber makes these principles operative.

Standing Committees

The Chamber has provided for its initiative work by organizing eleven standing committees. The mere naming of these committees (pilotage, documentary, coasting and home trade liner section, coasting and home trade tramp section, double taxation, emigration, sanitary, annual report, flag discrimination, general average, and international shipping conference) suggests the scope of the field in which the Chamber is actively at work on local or national problems by its own initiative.

The annual report of 1925-26 has for its first section the "Economic Position of British Shipping." It is interesting to note how fearlessly the Chamber, on the strength of the reports of these standing committees, attacks policies of the United Kingdom which it feels are wrong economically, and to observe how direct are its suggestions for the sure of economic depression. To quote: "Political physicians have not failed to prescribe restrictions upon trade, subsidies, and other artificial stimulants, flag discrimination, government interference and other "aids" which are hardly calculated to cure the ills of industry or promote its vigorous growth and which, instead, can only increase and protract the illness. The cure for the depression is the revival of trade, and the quickest way to revive trade is to remove all obstacles to it." The report shows careful and effective work on the part of the standing committees in the manner which they operate relative to trade and industry. Recently, a committee was appointed by the government "to inquire into and report upon the conditions and prospects of British industry and commerce with special reference to the export trade and to make recommendations in regard thereto." At once, the Chamber of Shipping placed before the committee evidence which supplied a general picture of the shipping industry of Great Britain under actual conditions. The very small proportion of the selling price of a manufactured export represented by freight was demonstrated. The influence of the shipping conferences in reducing the disparity in rates between one country and another, which, though arising from economic causes, is so often complained of by British merchants, was explained. The grave depreciation in shipping values and the very high cost of operation were set forth plainly; also it was shown "that freights bear no relation to the capital cost of a ship, but are determined by the supply and demand of the market." It is important to notice that the Chamber of Shipping is so active and so weighty in the affairs of British Government that it has become the source to which committees of inquiry naturally turn.

The Chamber also maintains committees whose prime business is "Safety of Life at Sea;" another group of committees devotes attention exclusively to "Finance and Taxation." The Shipowners Parliamentary committee is a watch-dog for maritime interests. Last year this Parliamentary committee concerned itself especially with the "Fees Increase" act and "Income Tax Questions arising on the Government Budget." While these initiative and investigative phases of the Chamber of Shipping are vital, the preeminent services of this organization are found in its groups of committees which work to develop its second great reason for existence—coordination.

Cooperation With Parliament

The British parliament has four important government committees on which members from the Chamber of Shipping always sit. These are:The Merchant Shipping Advisory Committee, the Pilotage Committee, the Lighthouse Works Advisory Committee, and an informal committee on coal carrying vessels. The annual report of the Chamber makes plain that its representatives are waging a stiff fight on Pilotage in an attempt to reduce excessive rates and to prevent " a monopolistic hold of a privileged professional class to the detriment of the seafarers and others who live by the sea." In addition to service on these government committees, the Chamber is very active on committees of private organizations, such as Traders' Coordinating Committee on Dock Charges, and the Association of British Chambers of Commerce.

International Shipping Conference

Perhaps American shippers have had contact most frequently with the Chamber of Shipping through its activities on the International Shipping Conference. Members of the Chamber serve on thirteen committees in this conference. Space will not allow a discussion of this manifold work of the committees, but one can not overlook the principle of coordination which is basic in all of these committee resolutions. Always there is an attempt at sane international organization which will lessen the number of international societies, all of which are trying to advance maritime commerce, but often work at cross purposes by proposing international agreements upon which some countries are ready to take legislative action and others are not.

The Chamber of Shipping gets four important slants on commerce; first, through its wide association with shipowners, where it does its initiative work for the betterment of shipper, shipowner, and men on deck; second, through its Shipowner's Parliamentary Committee, where fifty of its members bring practical and technical knowledge to the examination of all proposed legislation on maritime matters and give expert opinion as to the value of bills suggested to British shipping. It goes without saying that many ill-considered propositions of private members in Parliament never proceed beyond the initial stage or first reading. The Chamber gets its third slant on commerce by its participation, as members, on government committees, where it has actually to accomplish legislation. Fourth, the Chamber gets a world view by its activities in the International Shipping Conference, the "Comite Maritime International," and the subcommittees of the League of Nations.

In the international field, the Chamber is not slow to grasp opportunities of comparing notes with owners from other countries on problems of oil discharge, on progress toward adoption of principles for safety of life at sea, on questions of double taxation, on flag discrimination, and on other international aspects of water borne commerce. Since the war, the burden of keeping pace with the growth and activities of international organizations, which involve a great amount of overlapping, has been continually increasing. Here again, the Chamber of Shipping is emphasizing the value of coordination. It feels that the International Shipping Conference has proved its worth and that its work has been effective. The Chamber feels that more and more the International Chamber of Commerce has become the recognized mouthpiece of the collective business world and as such is indispensable and that, finally, "the Brussels Diplomatic Conference" is valuable as providing a well understood, simple and official means of giving final form to international agreements.

Imperial Shipping Committee

With this competent and experienced Chamber ever actively at work, it would appear that Great Britain's maritime cause was too well organized to need further assistance. However, we find that her sea problems are so far-reaching that, in special emergencies, other machinery has been called into play. The war left Great Britain, as it did many nations, with a disorganized merchant marine. Nearly all the food and raw materials used in the British Isles must be conveyed in ships and about two-thirds of British manufactures are exported. Naturally, the ship owners wanted as high a rate of freight as they could command and the shippers as low as they could procure. To meet this rate situation, to feed her people, and to restore her shipping industry, Great Britain had to find an immediate, flexible method. To this end, she established, in 1920, a semi-public Imperial Shipping Committee. This committee is compased of representatives of various governmental units in the Empire as well as representatives of shipping and trading interests. It is significant that governmental representatives are in the majority. The committee's activities cover a wide range. "To maintain satisfactorily the connections and at the same time encourage commercial and industrial relations between the mother country and the Dominions" is no small part for an investigation board to play. This committee has made reports on very urgent matters, such as Canadian marine insurance rates, prospective size of vessels for the Eastern and Australian trades via Suez, but probably its most interesting work has been in connection with rate complaints, its solution of the controversy over freight rates on Canadian flour in the North Atlantic being conspicuous.

Canadian Flour Case

In the Canadian flour case, complaint was made by Canadian millers that rates on flour from Canadian ports were higher than from United States ports and also that the freight on flour milled in Canada and shipped from American ports was higher than that on flour milled in the United States and shipped from those same American ports in the same vessels and to the same destinations. The Imperial Shipping Committee investigated the matter thoroughly and found the facts to be as alleged: further, they found that the differential out of American ports was due to the request of the conference of the Montreal lines. The result of the investigation was that the situation was cleared; not, however, by any force or legal authority, but solely by moral suasion and the prestige of the committee. As a result of this investigation, the Montreal steamship conference has definitely promised to abandon such practices in the future.

A distinctive feature of the work of the Imperial Shipping Committee is that it will not consider a rate complaint unless that complaint is endorsed by some association. By this means irresponsible or unreasonable complaints are suppressed. The committee's findings are not mandatory, but have been accepted by the shipowners as a result of the committee's prestige and influence. Surely, such a flexible and successful method of coping with a difficult situation deserves earnest consideration on the part of the American shipping public.

A third agency in the organization of the British maritime industry is the frequency of cooperation among British shipowners, transport workers, and dock laborers. One of the most successful cooperations of this kind was effected in order to prepare a safety code. An organization of employers (the shipowners) and employees agreed on a maritime safety code. Having worked out together the details of their plan, representatives of their group went to Parliament where, as has been pointed out above, technically trained men serve on the maritime committees. Here, the shipping group told Parliamentary committees of their agreement on a safety code and Parliament forthwith passed the code. It is remarkable to have such quick legislation; the action redounds really to the efficiency of the British shipping industry, which has so organized itself in effectual employer-employee groups that they can make themselves articulate to a very cooperative Imperial Shipping Committee or to a very active, broadminded, and vitally interested Chamber of Shipping, which is seeking means of coordinating this great industry the world over.

South Pacific News

Special Correspondence

FOR the first time for many years some new passenger steamers are being added to the meager fleet remaining on the Australian coast—or will be added when crews which are being sent to Egypt to bring them out agree to the owners' terms to do this work. The vessels are the Fezara and Fakama of the Khedival Line running from Alexandria to the Levant. They have been acquired by the A.U.S.N. Co., which is an Inchcape Line and the whole transaction is in the nature of an exchange, two old island steamers, the Navua and Atua of the Union Line being sent to Egypt. The intention was that the crews which take these ships to Egypt should bring out the Fezara and Fakama. But the men say that they would deliver the New Zealand ships and come back as passengers, while other crews should go to Egypt as passengers and bring out the passenger steamers for the A.U.S.N. Co. Probably the matter will be settled by compromise.

Oil Burners to Replace Coal Ships

The importance of this transaction lies in the advent of oil-burning passenger ships into the Australian interstate trade. Hitherto there has not been one on the coast, though the Union company and Oceanic company have had oil-burners running for a long time in ocean work. The reason is that all the Australian shipping companies are also coal owners and while several of the owners have desired to use oil for some time past, the coal interests have made them hesitate. The comparative freedom from labor troubles enjoyed by oil-burners, however, has just about overcome the coal advocates. Another thing is that the passenger traffic is increasing rapidly. It always has been a paying business while ships were running and soon it will be more so. The government steamers on the London run have been packed with interstate passengers every trip for months. The ships which have been sold recently were not adaptable for conversion into oil-burners, but some remaining will be changed over and others replaced later on.

Hoist with Their Own Petard

A bombshell exploded in the shipping world recently when Mr. Larkin, chairman of the Commonwealth Shipping Board, sent in his resignation to the Governor-General. Since Mr. Larkin returned from London several months ago, some change in the Board was expected. The other two members are Admiral Cresswell and Mr. Farquharson, naval and dockyard experts respectively. During Mr. Larkin's lengthy absence in London, they over-ruled his recommendation that the ships of the line should continue to call at West of England ports, and this caused Mr. Larkin to rush back to Australia to look after his and the line's interests. An inquiry by a committee into the situation resulted in the steamers remaining in the West Country trade and all seemed well, till Mr. Larkin resigned. When the Commonwealth Shipping Board was constituted there were over 100 ships belonging to the line. Now there are seven.

Changes In Union Company

For some weeks now there have been rumors afoot to the effect that changes would take place shortly in the executives of several of the Union Steamship Company's offices. The reasons given are the alleged early retirement of two big chiefs; but there seems a suspicion that they have been suggested by the visit to Vancouver of G. H. Morgan of the Sydney office in order to relieve Mr. Irons. No doubt when Mr. Irons is in New Zealand at the head office, the future rearrangement of the staff will be discussed, as there undoubtedly will be retirements within the next two years.

Dutch Line Keeps Ahead

The two regular liners of the Dutch Royal Packet Navigation Company, which trade between Sydney and Singapore, via Batavia, are soon to be replaced by two 9000-ton motorships with refrigerated space and modern passenger accommodation. The present ships are still most popular, having airy cabins and rooms, but the trade is growing fast.

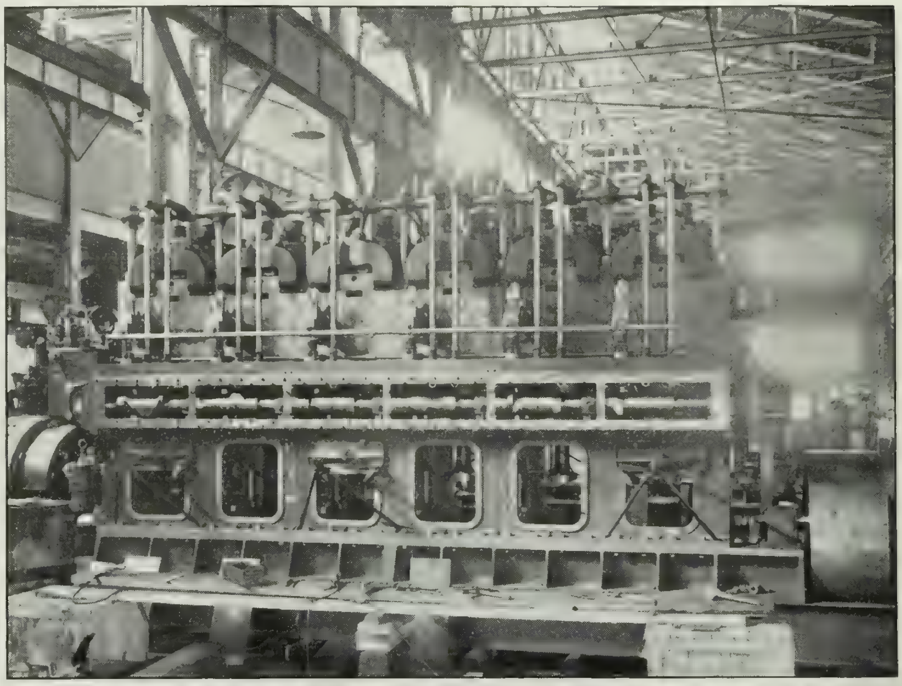
Tourist Boom in Australia

The truth is that Australia is arousing to the importance of the tourist traffic both into and out of the country, and the various agencies and companies are rivalling one another in bookings. New ideas in advertising which will start the citizens thinking travel thoughts are being sought. The activity of the Matson Line has had something to do with this, also the advent of Pickford's, the great British tourist people who will shortly open an office in Sydney.

Nelseco Busy on Ferryboat Engines

Notes on a Recent Visit at Groton to Inspect the Engines for the San Francisco Bay Ferries

By J. S. Hines



Six cylinder, 400 brake horsepower Nelseco diesel engine on erecting floor at Groton; the first of twenty-four units for San Francisco Bay ferryboats

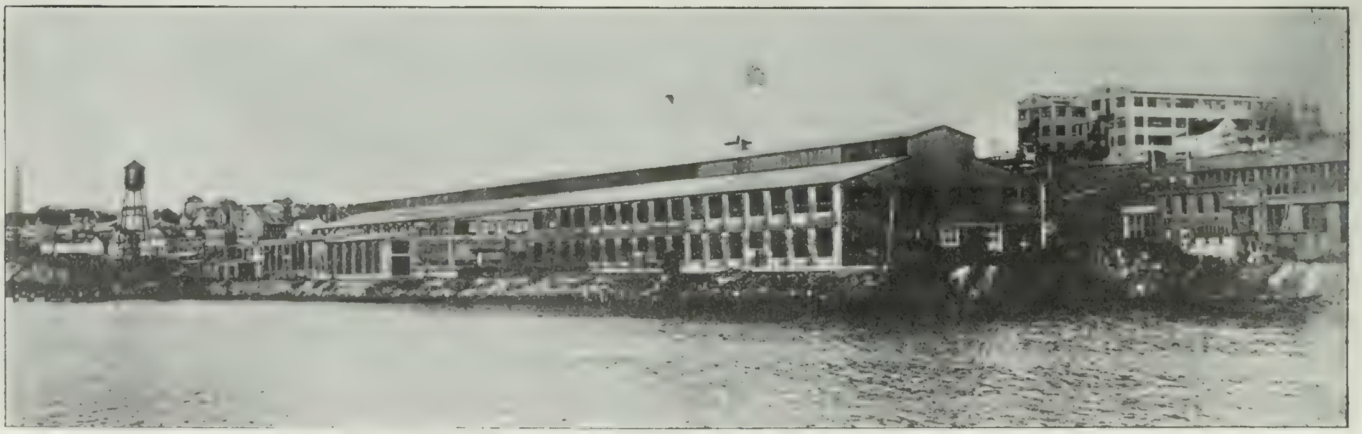
RECENTLY we had an opportunity of visiting the works of the New London Ship & Engine Co. at Groton, Connecticut, accompanied by Lyman S. King of the King-Knight Company which represents this engine manufacturer on the Pacific Coast. Mr. King was at Groton on a visit to obtain first-hand information as to all latest developments, and we consider ourselves fortunate in being able to go around with him under the courteous direction of the management.

We found things humming, every department working at high pressure, with the management only wishing that a few men for big machine tools would present themselves at the gate. The works are charmingly situated on the banks of the Thames in what might be called a truly rural setting. There are daily steamers plying between New London and New York, as well as good railway service direct to New York and Boston. The quality of the work turned out amid such ideal surroundings should be very high, and from our observation they are living up to their surroundings.

The main shop is over 700 feet long, constructed of brick and glass with crane-way for its entire length. This is served by a number of cranes up to 50 tons capacity, in addition to many wall cranes conveniently situated along its entire length. At the south end, the raw material enters and the largest machine tools are located; the machines, systematically grouped, gradually decrease in size up to within about 150 feet from the north end where the erecting and testing stands, fitting benches, etc., are laid out. We noticed seven test stands, all of which are fitted with electric generators to act as dynamometers. Galleries on each side of the main building, also running the entire length, accommodate small tools, automatic machines, sub-assembly department, tool room, and finished parts store.

The first thing that arrested our attention was the 3300 horsepower, double-acting, 2-cycle engine, 95 revolutions per minute, nearing completion for the Shipping Board. It is on its test stand, connected to a Heenan & Froude hydraulic brake and should be running in the very near future. We were impressed by the finish and good workmanship evident on the engine itself and on the component parts that we saw awaiting erection.

Passing this, castings for bedplates, housings, and cylinder blocks were seen in various stages of completion. From these it was obvious that the question of rigidity had received careful consideration and could not be improved upon. Once again we noted the very



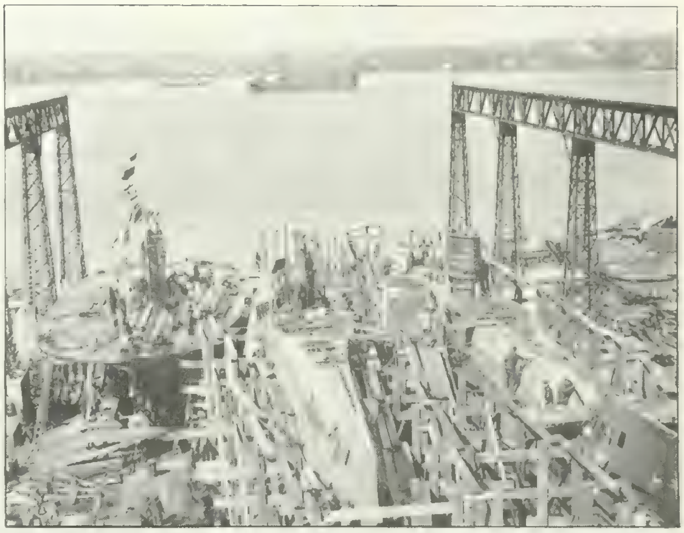
The New London Ship & Engine Building Company's plant at Groton from the Thames River.

fine castings turned out by the New London foundry, the care taken in cleaning them, and the clever way in which perfect alignment of the various parts is simply obtained, together with the extended use made of jigs and fixtures to insure interchangeability.

Heads, pistons, and liners appeared in orderly disarray in all stages of completion, from those with the characteristic red color denoting heat treatment to the finished parts being hydraulically tested. At the extreme north end we observed one engine for the Southern Pacific ferries running and being tuned up preliminary to official testing, and its steadiness and absence of vibration was readily noticeable. One engine was being piped up on its stand and four more were in various stages of erection. It was noted that the majority of the material in the shop was for the 24 engines which this company is constructing for the new Southern Pacific and the new Northwestern Pacific ferries and that the management and personnel are determined to meet the exceptionally short delivery time that was specified for this contract.

We also noted three auxiliary engines being completed which should be delivered by the time this article appears and which are destined for auxiliaries in a Gulf Refining Company oil tanker building by the Federal Shipbuilding and Dry Dock Corporation. These are 3-cylinder engines developing 150 brake horsepower at 260 revolutions per minute driving 100 kilowatt generators, while two of them had in addition 150 cubic foot 3-stage compressors driven by a magnetic clutch.

Near the main shop is a fitting-out pier, and we observed an 87-foot tug, the B. M. Thomas designed and built by the company, which was undergoing finishing touches prior to delivery. This tug is fitted with one of the 6-MIR-22 engines rated at 450 brake horsepower and we have never seen a finer engine room as to finish and layout in any tug that has come under our observation. The shipbuilding slips on which this tug, two direct-driven diesel ferryboats, and two submarines for Peru have been recently completed are also convenient to the machine shop, plate shop, and fitting-out sheds. A marine railway capable of hauling out a 5000-ton ship, with forge shop, iron and brass foundries, and pattern shop complete the main parts of an establishment which since its inception has built no other prime mover than internal combustion engines.



View of shipbuilding ways showing a ferryboat and two submarines under construction.

Chartering Business Increases

COMMENTING on the chartering activities of the Pacific Coast in a recent statement, Harry S. Scott, president of the General Steamship Corporation, reported 1926 to have been a most favorable year. The company's records reveal that over five hundred fixtures were made for Pacific Coast trading—a marked increase over the business of 1925.

"It is in fact the best year we have had in some time," Scott added. "And of particular significance is the growing tendency to consummate grain fixtures on the Pacific Coast for the United Kingdom. Not many years ago this was considered London's exclusive business, but a fair proportion of these charters are now closed on the Coast, and I expect local chartering firms to get an increasing share as time goes on."

The heavy machine bay at Groton with erecting floor at far end.

Large Diesel-Electric Savings

The diesel-electric sand pumping hopper barge Sandmaster.

THIS spring the Construction Materials Company, Chicago, the country's largest producer of sand, placed in service the twin-screw hopper dredge Sandmaster.

The power plant of this hopper dredge consists of two Worthington Diesel engines direct-connected to General Electric generators which furnish the power for driving the propelling motors, auxiliaries, and the sand pumps for loading, unloading, and the making of sand fills. A smaller Worthington diesel driven General Electric generator set is provided to take care of the power requirements in port.

This company operates a fleet of dredges, one of which is the Sandcraft, a sister ship of the Sandmaster except that it is steam driven. In deciding on the use of diesel-electric drive for the Sandmaster, the owners anticipated substantial savings in fuel and in labor costs, also additional economies in the elimination of delays in starting and stopping, getting under way, fueling, and making adjustments.

Since this is the largest commercial diesel-electric seagoing hopper dredge built in the United States, the owners and others naturally watched its performance with interest. During the month of September the Sandmaster and the Sandcraft both performed approximately the same work, affording an excellent opportunity to compare operating costs on a fair average basis.

For this month fuel and labor costs for the motorship Sandmaster were $2707.24 less than for the steamer Sandcraft. If capitalized, this saving is equivalent to a six per cent per annum return on $541,448. In addition, anticipated savings in fueling time and in starting, stopping, getting under way, and making adjustments were realized.

Both ships are of special interest because of the unusual class of service in which they are employed. In addition to transporting sand and gravel, the vessels are equipped with combined loading and unloading sand pumps which are piped in a manner unique to these vessels. These pumps are used to pump sand from the bottom of the Great Lakes into the vessel's hoppers. When the vessel reaches its destination these pumps are again used for unloading. The pumps with their piping system can cover efficiently a wide range of capacities and pumping heads.

Bethlehem Executive Honored

S. W. WAKEMAN, vice-president and general manager of the Bethlehem Shipbuilding Corporation, Ltd., was recently elected as a member of the administrative council of the Atlantic Coast Shipbuilders' Association. Mr. Wakeman, formerly general manager of the Fore River plant at Quincy, Massachusetts, is now the head of all the East Coast plants of the Bethlehem interests in charge of both operation and sales.

At their last meeting, the shipbuilders unanimously elected Mr. Wakeman as the representative of the New England Section on the association's governing body. He will direct the work of further enlisting the support of the marine interests in the New England states in the activities of the Atlantic Coast Shipbuilders' Association, which is now national in scope and is committed to the policy of permanently establishing shipbuilding on a profitable basis and conserving the industry as one of the basic factors in upbuilding and maintaining a successful and adequate merchant marine.

The administrative council is actively engaged in furthering the Association's legislative policy, under the terms of which tariff protection would be extended to shipbuilding. The close relationship that now exists among the shipbuilders of the country enables them to act through the Atlantic Coast Shipbuilders' Association as a unit in their efforts to remedy the conditions that retard America's maritime progress.

New N. Y. K. Liners

AMONG the features of the new quadruple-screw motor-driven liners to be built by the Nippon Yusen Kaisha for the California-Orient service will be an increased refrigeration cargo space. This space on the N.Y.K. line ships now operating between California and the Orient is capable of accommodating 50 tons of cargo. The new liners will have refrigeration facilities for 500 tons of cargo.

The liners, three of them, will be commissioned in 1928. They will cost $5,000,000 each. The new motorships will be of 16,500 gross tons, 580 feet long, 73 feet beam, and depth to shelter deck 42 feet 6 inches. Fully loaded they will have a draft of 28 feet 6 inches. The ships will be able to maintain a speed of 19 knots.

Accommodations will be provided for 700 passengers, 200 in the first cabin, 100 second, and 400 steerage. Names will be selected for the ships in the near future.

Diesel-Electric Versus Steam Drive for Stern Wheel Towboats

By Harry W. Parsons

CONSIDERABLE data have been compiled during the last few years covering the comparison of diesel and steam propulsion on ocean and harbor craft and particularly during the last year since the higher steam pressures and superheat now in common use ashore have, to some extent, been adopted for marine use. No comparative figures regarding costs, fuel, or weights of any reliability have been brought out on steam versus diesel drive for stern wheel river towboats, and the purpose of this article is to give what is believed to be a fairly accurate estimate on the relative costs of equipment, fuel costs, and weights of diesel and steam drive for that type of craft.

Electric drive in connection with diesel engines has been selected in preference to diesel geared drive due, in the opinion of many prominent steamboat owners and government engineers, to its greater adaptability. Both of these particular types of drive are in service on western rivers. Careful study has been given on the analysis of costs, weights, engine speeds, and adaptability of the oil engines and electrical equipment for river boats and the data given will represent an average price and fuel consumption.

On the steam drive it is not proposed to go to extremely high pressures or superheat, as it is not necessary to do this to bring the costs of equipment and fuel below that of the diesel. Neither is any radical or complicated steam equipment proposed; simply modern equipment operated at 260 lbs. working pressure and 135° superheat, such as is either in actual operation on river boats or is being installed at this time. The efficiencies and water rates are not expert test figures obtained for short periods, but are every day operating results. Those who have made a careful study and survey of modern river steam equipment will undoubtedly agree to this. Lest there be any doubt as to the water rates of the main engines and auxiliaries, it might be pointed out that the steam pressure or superheat or both can be raised 25 per cent without any additional cost as it is built for a working pressure or final steam temperature corresponding to that increase. Powdered coal instead of oil burning equipment is selected due to the almost universal use of coal and the difference in price.

The arrangement of and type of auxiliary equipment have been selected or checked by successful river operators, but various changes can be made without affecting the economy or reliability of the particular type of propulsion.

The average size of the boats of the most successful and experienced river operators is 600 horsepower, and the data in this article are based on that horsepower.

In the tables herewith, only the equipment, piping, and wiring necessary for the operation of the propulsion equipment are included. They do, however, include turbine or oil engine generating sets complete with switchboards and wiring, capable of handling the few other auxiliaries such as steering gear, ice machine, and capstans, and the steam or fuel consumption is based on this.

The figures show that the steam drive is considerably less costly but that the weight is over 100 pounds per horsepower more. The item of weight is not as serious as it may seem, as the steam equipment can be located in positions more advantageous to the general trim and over-all draft of the boat than the diesel-electric equipment.

Fuel Consumption of Steam Equipment

The steam conditions are as follows:

Pressure at steam generator, pounds	260
Pressure at main engines, pounds	250
Superheat at steam generator, degrees Fahrenheit	135
Superheat at main engines, degrees Fahrenheit	125
Vacuum at exhaust, inches	26

The data pertaining to main engines are based on two modern 16x32x78-inch tandem compound engines—full load rating 300 indicated horsepower each at 17 revolutions per minute—guaranteed water rate by manufacturer—12 pounds steam per indicated horsepower hour under the above conditions; and two 25-kilowatt, 125-volt direct current turbo-generators with a guaranteed rating of 35 pounds steam per kilowatt hour at 20 kilowatts at 250 pounds working pressure, 125 degree superheat and 26 inches vacuum.

Steam consumption, then, of the main engines would be 7200 pounds and that of the auxiliaries 2250 pounds, or a total of 9450 pounds.

The fuel consumption computation is based on the following values:

Coal at 13,000 B.T.U. per pound; efficiency of steam generator at 85 per cent; total heat of steam at 1283.75 B.T.U.; feed water temperature to steam generator at 180 degrees Fahrenheit.

Pounds of steam generated per pound of coal would then be—

$$\frac{13{,}000 \times .85}{1283.75-(180\text{-}32)} \text{ or } 9.67 \text{ pounds}$$

Since the steam per hour required for all purposes is 9450 pounds, the steam per indicated horsepower for all purposes would be 15.75 pounds.

The fuel consumption will then be:

Pounds coal per hour	977
Pounds coal per indicated horsepower per hour	1.63
Bushels of coal per day	292.5
Tons of coal per day (2000 lbs.)	11.7
Cost of coal fuel per day estimated at $3.50 per ton	$40.95

(The price of coal is at St. Louis, Missouri, in bunkers, a fairly central location on the rivers. This is for mine run coal and not for slack which can be purchased 75 cents per ton cheaper.)

Fuel Consumption of Diesel-Electric Drive Equipment

Fuel consumption main engines	.50 lbs. per B.H.P.
Fuel consumption for auxiliaries	.05 lbs. per B.H.P.
Fuel consumption all purposes	.55 lbs. per B.H.P.

(The fuel consumption of main engines includes generator, motor and gear losses.)

600 indicated horsepower steam gives 540 shaft or brake horsepower, to which must be added 25 horsepower for auxiliaries, giving 565 brake horsepower for

all purposes, which at 0.55 pound per brake horsepower per hour makes 24.1 barrels per day at $2.20 per barrel, or $53.02 per day for fuel oil.

Lubricating oil required over that for similar size steam engines is 3 gallons per day at 78 cents, or $2.34 per day.

This gives us $55.36 as the total cost of fuel and lubricating oil, taking costs as at St. Louis in bunkers.

Summary

Weights

267,900 lbs. weight of steam equipment.
205,000 lbs. weight of diesel-electric drive equipment.

62,900 lbs. difference in favor of diesel-electric drive.

Operating Costs

$82,200 cost of diesel-electric drive equipment.
63,735 cost of steam.

$18,465 difference in cost of two equipments.
$18,465 @ 6% = $1107.90 per year or $3.03 per day.
$55.36 + $3.03 = $58.39 total cost per day of operating diesel-electric drive equipment compared with steam.

Assuming 250 operating days per year, we get:

Fuel Steam Costs	Diesel-Electric Fuel Oil & Extra Lub. Oil.
$40.95 × 250 = $10,237.50	$58.39 × 250 = $14,597.50

$14,597.50 cost per year of diesel-electric.
$10,237.50 cost per year of steam.

$ 4,360.00 difference per year in favor of steam drive.
$4360 represents the interest on $72,666 at 6 per cent capital which could be used for other purposes such as barges or terminals.

If a diesel geared drive should be taken as a comparison with steam drive, the total operating costs would still be considerably in favor of steam, as due to the expensive arrangement of satisfactory gearing, jack shaft, etc., the installation cost would be practically the same as diesel-electric drive and the fuel cost would be about the same. Briefly, disregarding straight diesel drive which cannot be considered as practical, a modern steam propelled boat of 600 horsepower can be operated for approximately $4000 less fuel per year than either a diesel geared or diesel-electric boat of the same power.

Maintenance Charges

It would seem from actual river experience with both

Steam Equipment

No.	Equipment and Size	Average Steam Consumption	Weight Net	Cost
1	Steam generating unit, 3000 sq. ft. H.S.		106,000	
2	Smoke stacks and breeching		8,000	
1	Pulverized coal equipment complete	500	6,000	
1	Coal hopper and ducts complete		13,500	
2	Boiler feed pumps 7½″4½″x6″ hor. duplex	300	3,600	
2	Motor driven induced draft fans 2 B.H.P.		3,000	
2	16″x32″x78″—17 r.p.m. 300 I.H.P. tandem compound engines complete with maneuvering gear	7200	47,000	
1	Surface condenser complete with hotwell and piping to pumps		24,800	
1	Motor driven circulating pump		2,150	
1	Motor driven condensate pump		850	
2	Air ejectors	300	2,200	
1	Filler tank complete with fittings		12,500	
1	Grease extractor complete with valves		750	
1	Evaporator—9 ton capacity	400	1,500	
1	Evaporator pump 4½″x3¾″x4″	50	400	
2	Steam turbine generator sets 25 Kw.	700	5,900	
1	Switchboard complete for generators and light and power circuits		750	
	Main steam piping and valves		6,750	
	Auxiliary steam piping and valves—electric wiring		16,100	
	Boiler feed		2,050	
	Condensate and exhaust piping and valves		6,100	
	Total	9450	267,900	$63,735
	Weight per indicated horsepower			447 pounds
	Cost per indicated horsepower			$106.23

Diesel Electric Drive Equipment

No.	Equipment and Size	Weight	Cost
2	300 B.H.P. oil engines @ $65 per B.H.P.	88,000	
2	250 Kw. D.C. 265 r.p.m. generators	45,000	
2	35 Kw. D.C. exciters	5,000	
1	575 S.H.P. D.C. motor	35,500	
1	Switchboard and control equipment	10,000	
1	Set gearing, jack shaft, and bearings	15,500	
1	Set electric cables, fittings, and supports	4,500	
	Water piping, oil piping, etc.	1,500	
	Total	205,000	$82,200.00
	Weight per indicated horsepower		342 pounds
	Cost per indicated horsepower		$137

types of drive the cost of maintenance to be somewhat in favor of steam.

Personnel

The river engineer and fireroom personnel quickly adapt themselves to improvements in steam equipment. They are entirely familiar with almost any type of river engine and are becoming more so with water-tube boilers. Also the addition of an economizer as part of the steam generator serves as a protection against blistering or rupturing tubes. It takes less training to operate a pulverized fuel equipment than an oil engine and its reduction equipment, either electric or geared.

Syphoning of Barges

There has not yet been proposed any device capable of efficiently syphoning barges other than with steam. This means for the diesel drives on river towboats a donkey boiler with resulting initial costs and still higher overall fuel consumption.

The Diesel-Electric Drive from the Marine Engineer's Standpoint

By Robert C. Pairman

MODERN conditions and trade competition are constantly demanding higher standards of efficiency. As a result of this the shipowner must grasp every opportunity of getting more work out of his ships than formerly.

By reason of its greater fuel economy, which entails a very great reduction in both weight and volume of engines plus fuel, for a given radius of action in deep sea ships, the diesel engined ship can carry a great deal more cargo than a steamer of equal displacement. Furthermore, owing to the fact that the economical speed of a diesel driven ship is higher than that of a similar steamer, the voyages are of shorter duration and she can therefore make more voyages over a given time than the steamer.

All engines, whether steam or diesel, require a certain amount of upkeep, and in any direct driven ship this time must necessarily be spent in port. On a ship loading and discharging in a number of ports, the time available for maintenance in any one port is as a rule somewhat limited, and in order to keep the engines of a direct driven ship up to the mark long hours have often to be worked by the engine room staff.

The ideal power plant from both the shipowner's and the engineer's standpoint would be one which would run for 365 days without lay-up. The diesel-electric type of drive appears to offer the nearest approach to this ideal that it is at present possible to attain. Manned by a capable staff of engineers and equipped with an efficient workshop, the diesel-electric ship would be practically unaffected by lay-up in port.

A moderate sized vessel would be fitted with four main generating engines, any one of which could be used in port for driving the winches, which could be of ample number and power and still well within the capacity of the single driving unit.

It is a well known fact among engineers that it pays to be good to a diesel engine and that it is infinitely better to underload than to overload an engine, and it seems probable that some at least of the cracked cylinder heads met with in the earlier days of the diesel engine were due to overload tests on the test bed, which started minute cracks which later developed into serious defects. Such academic questions as the slightly increased fuel consumption at low loads are more than offset by considerations of the reduced maintenance costs.

The auxiliary generator engines in direct driven ships are in many cases sadly overloaded, which accounts for the fact that the upkeep of these engines is often high. The cargo winches play no small part in the earning capacity of a ship, and in this connection it may be noted that in some cases the power of the winches seems to have been fixed as equal to the nominal power of the steam winches on a corresponding steamer. It must be remembered, however, that steam winches can be, and usually are, overloaded to a very great extent, and this should be remembered when fixing the power of the electric winches.

The main engine room equipment of the two types of vessel is given as under—

Direct Diesel

2 large reversible main engines.

3 auxiliary generator sets with dynamos.

Maneuvering compressor and motor stand-by compressor.

Diesel-Electric

4 moderate sized main engines, non-reversible, with dynamos.

1 or 2 propelling motors.

Stand-by compressor.

From the above it will be seen that the auxiliary generators and the maneuvering compressor are entirely eliminated, and in place of the two large reversible main engines we have four moderate sized non-reversible generator engines. The maneuvering compressor would not be required.

Reverting to the question of maintenance, in the direct driven ship jobs that really ought to be done have frequently to be held over due to the fact that the stay in port is too short. This need not be so in the case of the diesel-electric ship, as the repair can be tackled on arrival in port, and if not complete by sailing time, the ship can comfortably leave on three engines and the fourth can be put on load as soon as the job is completed. The ship can thus cover many more miles per year than would be the case were it necessary to remain in port till all repairs were complete, as would be the case with the direct drive.

Again, with the diesel-electric drive it is not necessary to box up everything in order to shift ship in harbor, and the diesel engineer knows only too well to what extent shifting ship and getting ready for sea interfere with overhauling.

In a cargo vessel the engine room amidships takes up valuable space in which cargo is much more easily loaded and discharged than in No. 5 hold, which could comfortably house the diesel-electric installation.

First cost of diesel-electric equipment is no doubt higher than that of the direct drive, but this is offset by the uninterrupted running which this type of installation can give, and the consequent greater earning power of the vessel. The diesel-electric ferryboat is already a proved success and, in addition to its use on cargo vessels, the diesel-electric drive offers a very attractive means of obtaining large powers for high speed vessels without having to employ unduly large cylinder diameters.

Degeneration of Chinese Pirates

By Frank C. Bowen

THE latest outrage committed by Chinese pirates on a British ship, the case of the China Navigation Company's steamer Sunning, betrays a sad falling off in the code of ethics that they have maintained from time immemorial. In China, piracy is not regarded in the same light as it is in Europe, but is quite an honorable profession for a young man of spirit—provided always that he is not caught.

There are whole communities which have been pirates for generations and live quite openly in their guarded headquarters. The chief of these is on the delta of the Canton River, and is a township of three or four thousand souls set in the middle of a big tract of marshland and approachable only by a number of tortuous channels which are defended by stone barriers until they become a perfect maze, through which it is impossible for the uninitiated to find a way. These people have been living here for centuries and quite openly follow the vocation of pirate, while some miles further down the river, where two important trade lanes cross, they maintain a regular watch-tower on a big bluff overlooking the stream. Here a regular guard is kept which signals all useful intelligence to the headquarters in the marsh.

If it were afloat the gunboat patrol which is maintained by the British Navy would probably be able to exterminate it, but it is in Chinese territory and as such is immune from any molestation.

The signals are made in an elaborate code, but one can well understand how galling it is for the crews of the gunboats to have to watch news of their movements being signalled. The watch on this bluff is relieved regularly and quite openly without any interference by the Chinese authorities.

One of the principal duties of the watchmen is to signal the movements of the professional gamblers who travel up and down the river with fighting crickets and win large sums, arranging matches in the villages at which the steamers call and also on board. The Chinaman is ever a gambler, and backs his fancied insect freely. It is almost invariably the professional who wins in the long run, however, and he is a favorite prey of the modern Chinese pirate.

All idea of piratical junks has long been abandoned, for the patient Oriental finds it very much more profitable to ship as a passenger, and he is often willing to make half a dozen trips before the opportunity arises for him to give the signal to his band, who will immediately seize the ship. Their plans are so carefully laid that resistance is almost invariably useless. It is only in the very rare event of resistance being offered that the Chinese pirate kills or offers any violence to his victims.

As a rule the ship is taken to a quiet reach of the river, or into a bay, and there stripped most methodically of everything of value that she carries or that her passengers have on their persons. Nothing is missed and the work is done with remarkable celerity. All this time the pirates have been keeping a proper watch on deck and in the wireless room, and every routine message that comes in is answered in the proper manner. It may be a matter of pride to Great Britain that the recruits who are most eagerly sought for by the pirate bands are those who have obtained British Board of Trade certificates at Hong Kong.

The work of stripping done, the pirates either make for the shore in the ship's boats or else seize a junk in which they can remove their plunder. Then the engines are completely and scientifically wrecked, the wireless is put out of action and the ship and her passengers are left to be found by a passing steamer or by one of the patrolling gunboats. This system has been the rule for many years past and the only flagrant example of unnecessary bloodshed is in the case of a woman pirate who flourished for a few years after the war and who had a number of murders to her discredit before she was finally shot down herself.

All the violence of the pirates was reserved for anybody who betrayed them or who interfered with their doings in any way whatsoever. There was a case some twenty years ago where a reward was offered for the bodies of a number of pirates who had been killed in action with a British gunboat. A woman who lived with her family in a sampan on the West River discovered one of the bodies foul of her mooring rope one morning. She went to the local mandarin to claim the reward, but he appears to have immediately informed the pirate with whom he was in league. The poor woman got no reward, but some days later was attacked by the remnants of the band, was murdered with her three children, the bodies being left to drift down stream in the blazing sampan as a warning to others not to interfere with the pirates' business.

From the case of the Sunning, however, it appears that these methods are now changed and that the ancient brotherhood of pirates will soon be as uncontrolled as the bandits ashore. Having looted the ship thoroughly the outlaws carried away a number of passengers as hostages and before they left set her alight in a dozen places. They themselves got away in her boats, leaving scores of helpless wretches to be burnt to death or drowned. Fortunately a British gunboat arrived in the nick of time, put out the fire and was successful in capturing a number of the pirates.

This practice of leaving their victims in a burning ship without any means of escape is a heritage of the worst of the Spanish pirates at the beginning of the nineteenth century, the most bloodthirsty sea rovers who ever sailed, most of whom had learned their cruelty in the wars of liberation in South America.

Steam Versus Diesel

Some Points that Should Receive Consideration

By V. W. Hoxie

STRESS on cheapness of operating costs is one of the great points of diesel engine salesmen. While there is no question but that their argument is good when based on the average performance of earlier steam plants, it is subject to contradiction when special and particular attention has been given to more economical and modern high pressure prime movers. Of course, boilers that are designed to meet this new condition with their improved economy must likewise enter into the considerations.

The advance in boiler construction with superheaters and preheated air, by no means new in principle, has of late years been of such a character, when the modern turbine arrangements have been linked with them, to equal if not exceed the best records the writer can find on diesel engines. There seems to be no doubt on this point where plants of larger powers are considered. In the case of smaller powers, such as tenders, so far the internal combustion engine can be conceded certain advantages, particularly as regards first cost.

When, however, comparisons are made with higher powered vessels, it becomes an interesting study and, if anything, is favorable to steam as all elements are carefully entered into and a balanced summary is made. Take for instance the steam plant of the American Gas & Electric Co., which has operated for over a year at 535 pounds steam pressure and a total steam temperature of 705 degrees at the turbine. This plant has shown a shaft horsepower on 0.6 of a pound of oil as an average. This fuel oil is not of a special kind, but just ordinary fuel oil of commerce. A diesel with its higher priced and refined oil would be hard put to produce equal results when cost per pound of fuel is considered.

A. S. Hebble of the Southern Pacific Company, New York, has designed a steamer which will carry 350 pounds steam pressure with a superheat of 200 degrees and estimates she will develop with the turbine machinery a shaft horsepower on 0.75 pound of fuel oil per hour under regular operating conditions.

With differences in costs between diesel oil and ordinary fuel oil compared on an average basis, the advantages claimed for the diesel rapidly disappear. Increased carrying charges, such as interest due to fixed charges on first cost and depreciation charges, must also be entered up against the diesel.

It is true these high steam pressures demand boilers of modern design but there has, up to the present time, been no real necessity of going to special materials.

The Babcock & Wilcox company have been and are making exhaustive research and experiment to provide a boiler which will meet the most exacting conditions of even higher over-all temperatures than are now proposed or in use. Even now such boilers as have so far been installed are producing splendid results in the way of fuel economies and upkeep costs.

When we commence to take into consideration the first cost of large diesels a careful check of these necessarily heavy engines will show that their costs are not far from $200 per shaft horsepower. Comparing high pressure boilers and improved turbine engines, a shaft horsepower can be installed in a steamer not to exceed $90 per horsepower. Some figures are available to show that this cost can be reduced considerably.

The investment charges and depreciation on the difference of say $110 per horsepower of the two types will show up as about $18.70 per shaft horsepower. If we consider say a 300 shaft horsepower installation this item alone would amount up to $56,100 per year. This is a very respectable sum that must be considered when comparing the savings as represented by advocates of the diesel engine. It is true certain savings are increased by lessening of fire room personnel; but is it not reasonable to suppose that reducing personnel of the type generally found in a fire room means depending upon repair yards for labor due to this shortening of the crew?

The type of men making up the final crew of a diesel engine room must be high grade. This of course means higher salaries, otherwise depreciation and upkeep costs will increase in far greater proportion. Repairs to diesels call for precision instruments for measuring and adjustments. Precision tools with expert mechanics are a necessity and it has been noted that many of the so-called successful motorships are operating on these lines. If this is true what about obtaining crews in every port?

Lubrication costs of diesels as compared to turbine layouts are reported as about 10 to 1. Something additional must be said about the matter of costs and weight. In a moderately sized passenger vessel the weights of diesel engines will exceed that of steam equipment by approximately 55 per cent, while the costs of manufacture will run about 45 per cent greater. These factors, it would seem, apparently wipe out any differences in fuel and personnel costs that are not always presented in their true light.

It is reported in the February 1924 number of the Journal of The American Society of Naval Engineers that balancing devices for steam turbines were made in the machine shop of the Bethlehem Shipbuilding Corporation, Fore River Plant, at an approximate cost of $100. For those interested in torsional vibration problems in diesel engine installations and the failure of crankshafts due to this cause, reference is made to the article by John F. Fox, mechanical engineer, U. S. Navy Yard, Brooklyn, N.Y. This article is published in August 1926 number of the same journal. From the information gathered as above it has been concluded that much of the blame that has been attributed to metallurgical causes has been shown to be due to torsional vibration in the case of diesel engines, no matter how excellent the material entering into the make up of same.

There has been a great deal written about the Shipping Board calling a halt in its dieselization program of conversions. This would seem to be the logical thing to do, then construct a modern vessel equipped with diesels and an exactly similar vessel with the very latest in steam equipment. It must be evident to all that this is the only fair and proper method to get at the bottom of this entire problem to the satisfaction of all concerned.

After this operate these two vessels in the same class of service or trade route and compare results.

Developments In Small Diesel Engines

New Line of Fairbanks-Morse Diesel Engines in 10 h.p. Cylinder Size Shows Trend in Design. Small Diesels Are Now on Par with Large Main Units

IMPROVEMENTS in the design and construction of diesel engines have been unusually rapid during the past few years. That this development has reached the small engine field is shown by the fact that Fairbanks-Morse has recently announced a line of diesel engines in a 10 horsepower cylinder size operating at a speed of 650 revolutions per minute.

This new line is to be built for direct drive for use in small craft and also in diesel generating sets for use as an auxiliary in connection with the main propulsion engines. The new engine is already available in the 2 and 4 cylinder sizes, which are rated at 20 and 40 horsepower, and in the generating sets which are rated at 18 and 36 kilowatts, and it is expected that the 30 horsepower unit and 27 kilowatt generating set will be brought through shortly. The generating sets operate at a speed of 800 revolutions per minute.

Although the new engines follow in general principle the lines of the 60 to 360 horsepower series which are described in the February, 1926, issue, they have a number of interesting features which warrant detail description.

The cylinders are cast en-bloc and the exhaust header applied in a simple manner, a feature which greatly increases the rigidity of the entire assembly and at the same time reduces the weight in pounds per horsepower. In many cases small engines on shipboard have to be installed on foundations which are not rigid. This rigidity of the construction then becomes an important factor in maintaining bearing alignment.

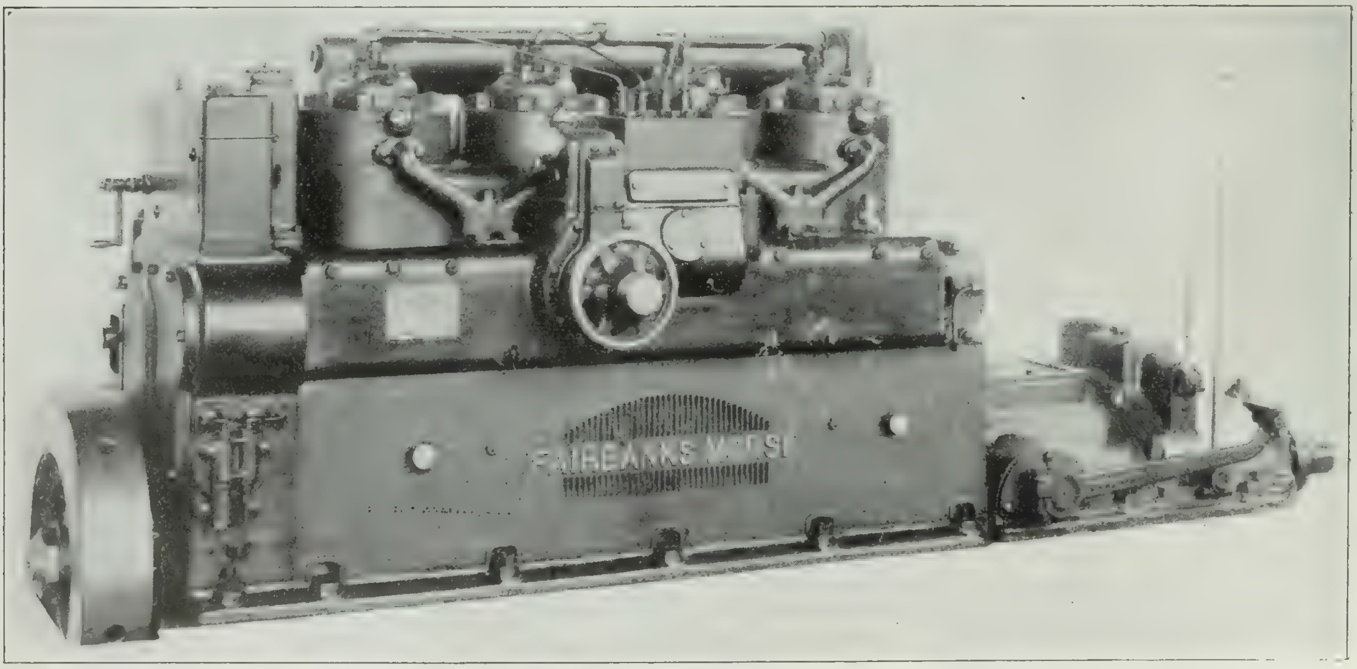
Other important features of the engine include complete automatic lubrication, a simplified control which is arranged for both manual operation and for governor control, and a built-in transmission. The lower base is of sturdy construction with heavy transverse bridges which form the main bearing supports. At the forward end of the lower base is a compartment which houses the gear which drives the lay shaft and the eccentric which drives the built-in air compressor and circulating and bilge pumps. This compartment also forms a sump for clean lubricating oil.

In arranging for the drive for the built-in compressor and circulating bilge pumps, the designers have used a very ingenious arrangement. The eccentric actuates a rocker arm which in turn drives the piston of the compressor through a link connection. The piston rod of this compressor is extended so that it becomes the piston rod for the pump. This pump is double acting with two sets of valves, one side of the pump being used for circulating water and the other side as a bilge pump. This arrangement is very simple and compact, yet quite accessible.

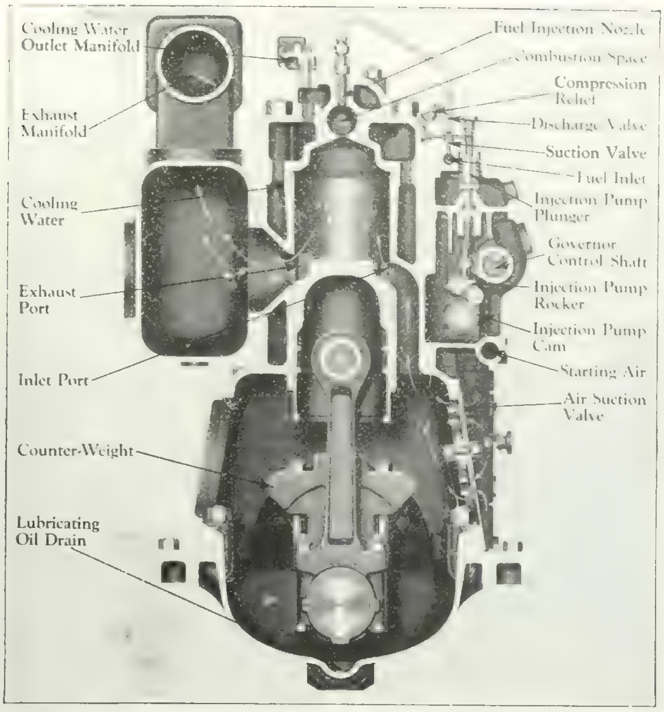
The shaft which carries the idler gear of the lay shaft train also carries an eccentric which drives two plunger lubricating oil pumps. One of these pumps takes its suction from the crank case compartment and pumps the oil under pressure to the lay shaft bearings and to the rockers, rollers, and pins that make up the injection and governor pump drives and the compressor and pump drives. The other pump takes the oil from the individual crank case of each cylinder and pumps it to the filter. Since the oil used in engines of this rating is a comparatively small amount, filtering can be handled in batches and filtered oil poured back into the main lubricating sump or to the force-feed lubricator.

This force-feed lubricator lubricates the piston pins, cylinders, crank pins, and main bearings. The control is extremely simple and yet functions so perfectly that the engine will throttle down to a very low speed and yet accelerate suddenly in the same way as a high grade automobile engine.

There is one important difference in the fuel injection scheme which is used with this line of engines and that which is used in other Fairbanks-Morse diesels. Fuel injected is controlled by the length of plunger stroke and not by closing the suction valves. The suction valves are automatic in their operation; that is, they open and admit fuel to the barrel of the injection pump on the down stroke of the plunger. The stroke of the plunger is regulated through a very simple linkage arrangement. The governor control shaft, as shown in the accompanying transverse section of the engine, is pivoted eccentrically so that any movement of the governor weights tends to move the pump plunger push rod with respect to the cam operated rocker arm. The position of the push rod on this rocker determines the



With its built-in transmission and en-bloc cylinders, this 4-cylinder, 40-horsepower marine diesel presents a picture of simplicity and compactness.



Section through cylinder of 20-horsepower 2-cycle airless injection diesel engine.

amount of fuel injected by the pump. When the push rod is moving over towards the pivoting point of the rocker the movement of the push rod approaches zero. The pump plunger is operated through a cross head to which the push rod is connected. This system of control gives very fine gradations of the amount of fuel to be injected and is more simple than any system of suction valve control.

The fuel supplied to the suction valves is under a pressure of five pounds. This is obtained by having the gear pump which supplies the fuel to the auxiliary fuel reservoir on the engine operated against a spring loaded relief valve.

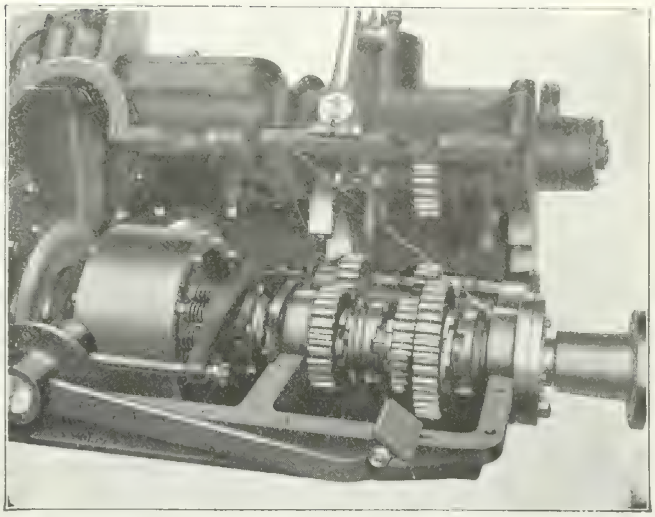
By having the fuel under pressure the cylinders of the injection pumps are positively filled on the opening of the suction valve and the plunger always discharges the full amount of fuel called for by the particular governor setting.

This engine is built non-reversing and is started by a quick opening air valve in the air line to the pipe which leads to the starting valves. The governor setting is changed by means of a small hand wheel.

It requires several turns of the governor wheel to effect any substantial change in the speed of the engine, and so a manual control is provided. This works directly on the governor control shaft and therefore changes the setting of the injection pump plunger stroke to control the engine speed below that for which the governor is set, without changing the setting of the governor springs. For most marine maneuvering service it is probable that the manual control will be used exclusively. When, however, it is necessary to operate the engine for any length of time at reduced speeds it is advisable to set the speed by means of the governor control wheel. The manual control is also used for shutting the engine down and for any quick changes of speed where the load remains reasonably constant.

Another important feature of the new line of marine diesels is the use of a built-in automotive type transmission which gives two speeds forward and one reverse. With the transmission set for half speed operation and the engine turning over at half speed, the propeller turns at one-fourth full speed. At such a speed as this it would be possible to operate a fishing boat all day for trolling and still have the engine operate economically. Full power and full speed of the engine are used for reversing which is also another feature of the design.

This transmission is built with the same refinements that are used in building the engine and all gears are case hardened and every part is built to the highest specifications. In other words, it is not just a transmission which is added on to the engine as is the case in so many jobs of this type. Since the clutch is of the multiple disc type and there are no friction bands or small planetary gears in the transmission assembly, it is practically indestructible and may be operated for unlimited periods in reverse without overheating. This will be an important consideration from the standpoint of the user since there has sometimes been more trouble with transmissions and clutches than there has been with the engine itself.



The built-in transmission gives two speeds forward and utilizes full speed and power of engine in reverse.

A Pool on Small Hulls

Six Year Statute of Limitations Upheld

ALTHOUGH the Tucker Act, passed by Congress in 1887, allows claimants against the United States Shipping Board a period of six years in which to file suits, the Shipping Board and its operators have consistently endeavored to take refuge behind the two-year limitation of the Suits in Admiralty Act. A ruling in favor of the longer period has just been handed down by Judge James of Federal District Court in Los Angeles in the case of the Apus.

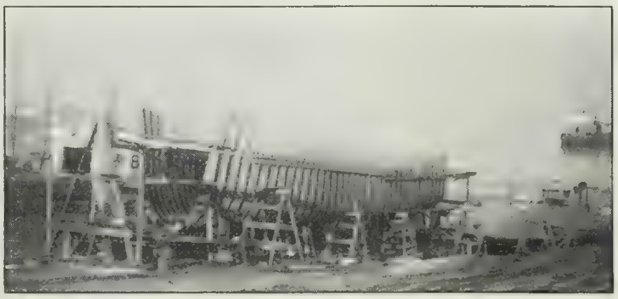
This case involved a claim by the Goodyear Tire & Rubber Company for damage to a cargo of rubber en route from Singapore to Los Angeles in 1922. After a lengthy series of negotiations the Shipping Board refused to honor the claim, and the Goodyear Company and their insurers filed suit in April 1926.

The government put forth the contention that since the action could have been brought under the Suits in Admiralty Act of 1920, under which the statute of limitations is two years, that therefore the shorter period should be effective even in suits brought under the earlier act. Counsel for the rubber company successfully argued against this contention, however. The successful claimant in this matter was represented by Derby, Single & Sharp of San Francisco. Kelly & Young of Los Angeles and W. S. McNabb and Donald Armstrong, United States attorneys, appeared for the government.

This decision, while on a comparatively minor point of procedure, is important to cargo owners and insurers in the Ninth Circuit. A great number of cargo claims against Shipping Board vessels are outlawed in two years, due to the inevitable delay in getting these claims in the proper channels, but the six-year period allows ample time for even the most dilatory cargo owner to complete his investigation and file his claim. It must be noted that Judge James' ruling applies only to Shipping Board vessels and is subject to provisions in the bill of lading.

Pacific Workboats and Their Power Plants

At the San Francisco Boat Yards



The Viosca in frame at the yard of Anderson and Cristofani, San Francisco

Anderson & Cristofani, boat builders at Hunter's Point, San Francisco, are busy these days. The workboats Ida May and Geo. W. Freethy have been extensively overhauled and several others hauled out for minor repairs. On the ways the new hull of the Viosca, building for Rocholl, Ruffo & Co. for the Mexican Coast trade, is rapidly coming into shape. She is 86 feet long, 21 feet beam, and 8 feet depth of hold.

Staunchly built of Oregon pine, this boat has good lines for carrying capacity, seaworthiness, and propulsive efficiency. Her power plant will be a 110-horsepower Union Diesel, which will give her a speed of about 8 knots. Besides a limited number of passengers, she will carry over 100 tons of freight. The hull is being constructed under the supervision of A. W. Lawson and R. Z. Dickie.

In the boat sheds is a 44-foot cruiser nearly completed for A. Klein of San Jose, which will be powered with a 50-75 Redwing gas engine of 6 cylinders. A 38-foot fishing boat, also just completed for S. Sweins of Eureka, has an Atlas-Imperial 18-horsepower 3-cylinder gas engine. A new fishing boat for Capt. Diffibaugh of Eureka is 40 feet in length, with an Atlas-Imperial engine same as the one above mentioned.

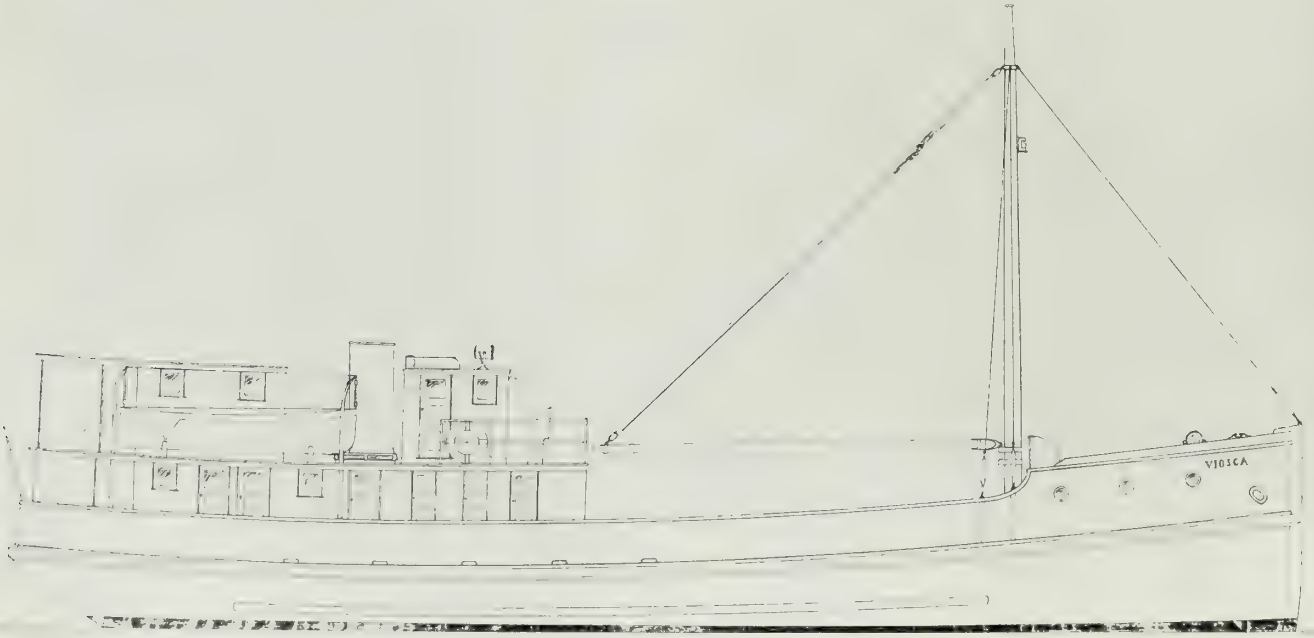
Bruer & Siemer's yard at the foot of Evans Street, San Francisco, is doing considerable repair work on small boats and barges. This firm does not take on new jobs, but confines itself entirely to repairs and, making a specialty of these, has many customers.

John Twigg & Sons, San Francisco, have just finished rebuilding the Gertrude, a commodious cruiser owned by Newton Neustadter. The additional accommodations will make this craft very comfortable and detract nothing from her speed. Mr. Twigg says the outlook for increased business is fine.

George W. Kneass Co. boatyard, San Francisco, is quite busy on a big contract to build nine whale and otter boats for Capt. C. T. Pedersen. These boats are to be about 32 feet in length and will be powered by 8-horsepower gas engines of the Kermath type. A larger craft to be used as a freighter in Alaska waters by Capt. Pedersen is to be 50 feet in length and 14 feet beam. She will be powered with an Atlas-Imperial 20-horsepower gas engine. Besides these utility boats, Kneass is also building a 47-foot cruiser to be powered by two Hall-Scott 200-horsepower gas engines; also a 45-foot cruiser which will have two 150-horsepower Kermath engines.

William Cryer, boat builder at Oakland, California, has several craft in hand and inquiries of prospects for future work. The new fishing workboats for the Alaska Packers Association are nearing completion and are fine examples of rugged and good work and excellent design. With their Atlas-Imperial engines these two additions to the Packer's workboat fleet will show up strong in the way of speed and power.

James Robertson's Shipyard at Alameda has just completed the new seagoing tug for Harbor Tug and Barge Co., San Francisco, named the A. E. Williams for the general manager. This will be the last job at Robertson's old yard. The new plant and dry-dock will be near the Park Street Bridge, on the Alameda side of the Estuary. Several new work boats are being talked of, and Robertson expects to share in this program.



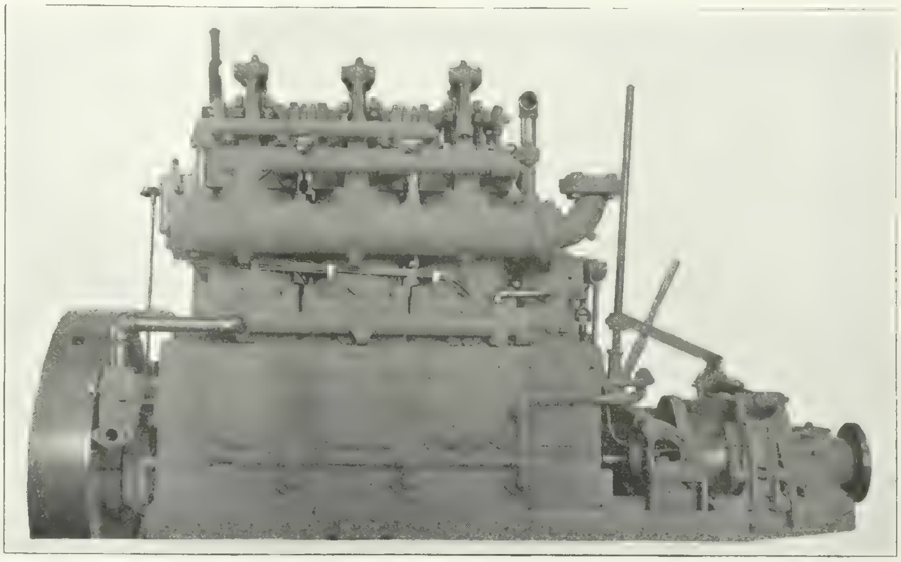
Outboard profile of the coastwise motorship Viosca.

New Atlas-Imperial Unit

THE Atlas-Imperial Engine Company of Oakland, California, has just completed final trials of the first unit of their new 30-horsepower, 3-cylinder, solid injection full diesel engine. This engine has been designed by the engineers of the company to supply demands for a small but good diesel. A Pacific Marine Review writer had an opportunity to observe this new motor on the block recently. Its sturdy construction and fine mechanical workmanship appealed to the eye, while the ease with which the machine gave out 39 horsepower was remarkable. With no fuss or trouble she could be easily and smoothly loaded to that rate, and instantly after eased down to an idling speed so slow that a stop looked likely, but she would lazy along until more speed was desired when at a touch the little machine would get into a full stride again.

The cylinders of the new unit are 6 inches in diameter and 8½ inches stroke of piston. The designed speed is 500 revolutions per minute, but at 600 revolutions there was no sign of distress or trouble. Starting from cold is accomplished by means of compressed air, always certain and reliable, giving an easy and positive method of handling. The weight, complete, is 4600 pounds and includes auxiliaries, air receiver, reverse gear, propeller shaft, and many spares; in fact everything necessary to make a complete job except the main fuel tanks and a few pipe fittings and connections.

Twelve of these 30-horsepower units are now going through the shops and already half of them have been sold. The builders feel sure that there will be a big demand for this new 1927 model of the Atlas-Imperial engine. The demand also keeps up for the larger sizes of the firm's engines. Five engines in horsepower ratings from 30 to 270 were observed on the test blocks, with the erecting bay full of other machines in various stages of completion. The firm is running two shifts and from all appearances there will be many of these engines built during the coming year. The latest one, the 30-horsepower size, is believed by the management to be a winner.


Exhaust side of the new 3-cylinder Atlas-Imperial diesel.

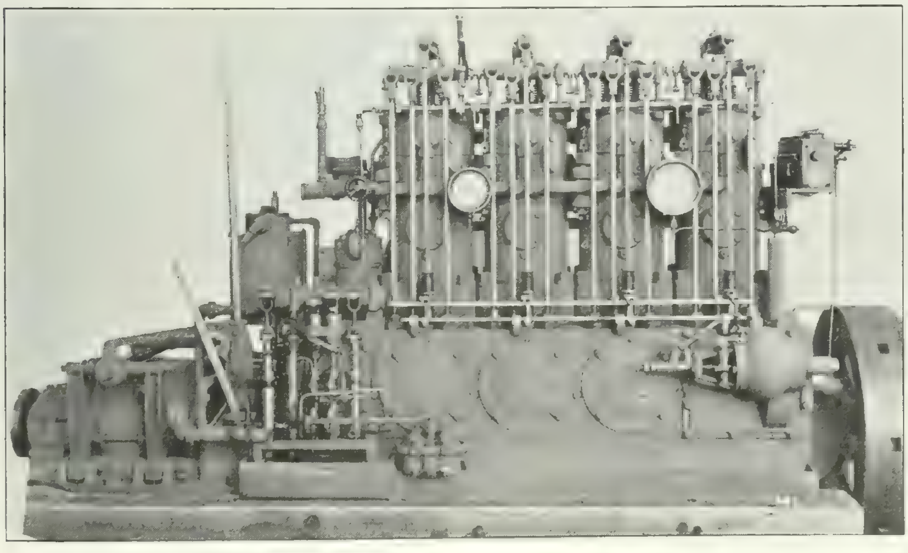
Hicks Reorganization

SOME twenty years ago the first Hicks heavy duty marine gas engine was built and installed in a small San Francisco fishing boat. From the start the Hicks engine won its way with the fishermen. It also was well received by other boat operators, and for many years Hicks was kept busy building these sturdy and reliable units. Little or no effort was directed toward the publicity of the Hicks engine, the builder contenting himself with making a good engine at a fair price and giving constant service to any he built, no matter how long used. He also stood ready to allow a liberal turn-in allowance if a new or larger engine was desired. In this way the late Mr. Hicks built up a good business and his engines were popular with the men who demand and must have an engine which will always work.

After the death of Mr. Hicks the construction of the engine languished for a time, because of other interests attracting those left in charge of the business. Recently, however, arrangements have been made with the Yuba Manufacturing Company, San Francisco, which has large manufacturing facilities and unlimited capital, to take over the business.

Hicks Engine Sales Company, the new sales organization, will enter the field and endeavor to bring before the buyers and users of the Hicks engine the fact that prompt delivery of orders and prompt service in every particular will be given them. Branch agencies are being rapidly established along the Pacific Coast. Agencies have already been established in Washington, British Columbia, southeastern Alaska and points north, besides in Astoria, Eureka, Pittsburg, Monterey, San Pedro, and San Diego.

It is the intention of the new firm to push the sale of Hicks engines, and an extensive publicity program is contemplated, with the object of being able, through mass production, to place on the markets of the world a heavy duty marine gas engine of the


Control side of an Atlas-Imperial diesel engine.

well known Hicks type, at competitive prices. The old time favorite sizes of 6, 8, 10, 12, 15, 18, 24, and 35 horsepower will be continued. Although the original Hicks type will be closely adhered to, improvements in design material, and workmanship are to be paramount features of the new Hicks engine. Service and stock stations will also be established so that users may never be subjected to vexatious delays in the event of replacements or repairs being needed. It is also the intention of the Hicks Engine Sales Company to establish a school of instruction near the headquarters of those who use these engines, where operators will be shown practical ways to meet the difficulties which always arise where engines are used and subjected to hard work.

Important Diesel Announcement

THE Foos Gas Engine Company of Springfield, Ohio, for forty years manufacturers of high quality internal combustion engines exclusively, announce the appointment of Garvey and Palmer, Inc., of Los Angeles, as exclusive distributors of the full line of the Foos engines for the Pacific Coast states, the west coast of Mexico, and the Hawaiian Islands.

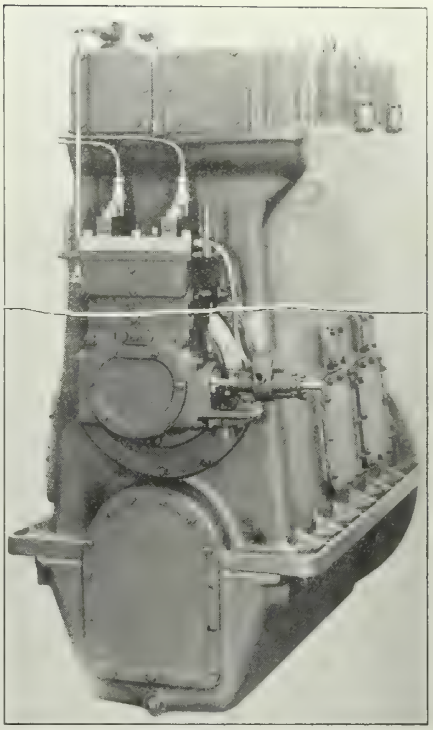
The Foos line of internal combustion engines have been leaders in many applications in America for forty years. In exacting service and demand for dependable power, the Foos internal combustion engine is claimed to be supreme in close governing, freedom from vibration, simplicity, and the low cost of maintenance.

For some years the Foos Gas Engine Company has been building a heavy duty diesel engine of the 4-cycle solid injection type.

The most recent development in the Foos diesel engine line is a light weight, medium speed engine of true diesel type weighing from 30 to 60 pounds per horsepower and ranging in capacity from 50 to 475 horsepower completely enclosed and especially adapted for marine and mobile equipment. This engine has great flexibility, is perfectly balanced, and has the high quality of workmanship and materials characteristic of the Foos engines.

The outstanding points of the new type L engine are: counter-balanced crank shaft; overhead cam shaft; individual cylinder liners; dual intake and exhaust valves; extra large waterways, insuring cooling of cylinders; individual injection pumps for each cylinder, thereby eliminating possibility of overloading; no working parts visible, engine entirely enclosed; every moving part lubricated by pressure system; no grease cups used, oil cans eliminated; while completely enclosed, the design insures exceptionally complete accessibility.

Garvey and Palmer, Inc. will maintain offices, show rooms, and stock rooms in Los Angeles, San Francisco, and Seattle. In each of these ports complete stocks of the various sized engines will be carried, as well as large stocks of spare parts, so that all orders will be filled for immediate delivery.



Forward end of the Foos diesel engine, Type L, two-cylinder size.

Ralph S. Palmer will be in charge at the Los Angeles office and J. Garvey at the San Francisco and Seattle offices.

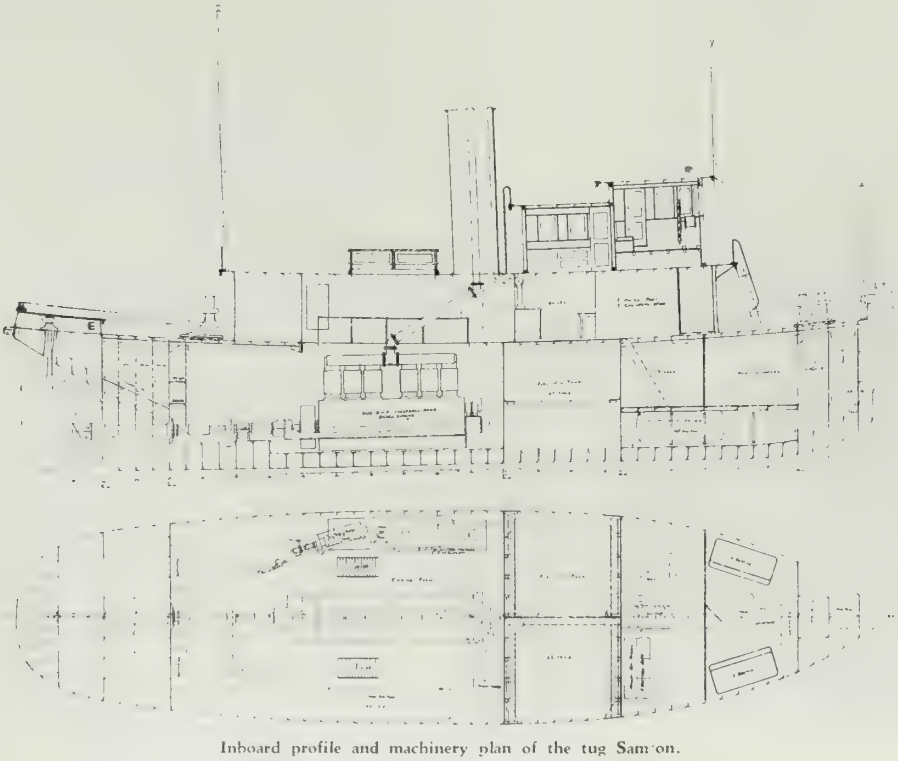
Diesel Tug Samson

LATE in October the Spedden Shipbuilding Company at Baltimore delivered to G. F. Pattinos of Philadelphia the river, coastwise, and seagoing tug Samson. This is the third diesel tug built by this owner and it is interesting to note that all of them have been equipped with direct drive, directly reversible, Ingersoll-Rand diesel engines.

The Samson, designed by M. C. Furstenau, naval architect of Philadelphia, is entirely of steel construction, with scantlings and plating in excess of requirements for A-1 rating in Lloyds or the American Bureau. Her principal characteristics are:

Length on deck	87′ 0″
Length between perpendiculars	79′ 0″
Breadth molded	21′ 0″
Depth, Molded	11′ 6″
Draft, Mean	9′ 0″

After a short trial run, which amply demonstrated the smooth running and maneuvering qualities of her Ingersoll-Rand engine, the Samson left Baltimore Friday night, October 29, arriving at Philadelphia Saturday morning. Within a few minutes after taking on fuel and supplies she was on her way with a 10,000-barrel barge in tow for Wilmington, North Carolina, and Brunswick, Georgia. Although bad weather was met outside, the run of 475 miles from Delaware Breakwater to Wilmington was made handily in fifty-seven hours.



Inboard profile and machinery plan of the tug Samson.

Auxiliaries—Ship Supplies—Marine Equipment

The Dahl Electric Organization

THE Dahl Electric Company of San Francisco has recently established a marine engineering department. This will be directed by C. A. Dahl and William Sylva. The former is a son of the founder of the firm well known for many years along the San Francisco waterfront, and Mr. Sylva is also a Californian who has specialized in marine work. He served in the U. S. Navy, ranking Machinist's Mate, and holds mercantile licenses as engineer and pilot. With this combination of talents, customers will be well served.

One special line that will be taken care of for the present is that of Mianus engines, both gas and diesel. These well known units are manufactured by the Mianus Sales Corporation at Stamford, Connecticut, and are sold by representatives of that firm in all world ports. Units of from 25 to 120 horsepower in the diesel type and from 25 to 40 horsepower in the 4-cylinder gas type will be stocked; also small sizes of the single and 2-cylinder styles.

The firm is also agent for the Hallett Manufacturing Co. of Los Angeles, builders of 4-cylinder high speed gas engines in 10-horsepower sizes. This engine is light and adapted to small craft, the weight of the engine alone being but 190 pounds. They are also fitted with 2 to 1 reduction gears for connection to the propeller shaft. With the gears added, the weight of the engine is but 265 pounds.

The new marine department of the Dahl Electric Company is central and northern California representative of the CO_2 Fire Equipment Co., whose output is so well and favorably known in the marine field.

Besides the above, the Dahl marine engineering department will handle a newly designed toilet for small vessels. The pump for this unit is operated electrically and is positive in its action. The outflow can be either at the water line or through the bottom of the vessel, with no danger of clogging or back flow. There are no tanks to leak or pneumatic valves to stick and no ferrous metal is used in the construction. These toilets have been installed on H. O. Harrison's yacht K'Thanga, Don Lee's Invader, and Hart Weaver's Frevilla. Satisfactory operation of these installations prompted the placement of three units on the new exploration yacht Northern Light, nearing completion at the yard of W. F. Stone & Son, Oakland, for John Borden of Chicago.

George W. Codrington.

Winton Executive Visits Europe

GEORGE W. Codrington, vice-president and general manager of The Winton Engine Company, Cleveland, returned on the Berengaria recently from a six weeks' business and pleasure trip to Europe. Mr. Codrington reports that he had an interesting trip and that he enjoyed especially the time spent at the plants of some of the European diesel engine builders. At all of the various plants which he found time to visit, he was treated with the utmost courtesy and consideration. "The leaders in the diesel engine industry abroad are certainly a progressive, high grade group of men," says Mr. Codrington. "Coming into close contact with them, getting their viewpoint on various features of diesel engine designing and building of interest and special significance to me was a rare privilege, and to partake of their unexpected and cordial hospitality a never-to-be-forgotten pleasure."

Mr. Codrington visited the following plants: Germania Werft, Kiel, Germany, where the Krupp diesels are built; M. A. N. diesel plant at Augsburg, Germany; Sulzer Brothers, Ltd., makers of the well known Sulzer two-cycle diesel engines, whose plant is located at Winterthur, Switzerland; Krupp Steel Plant, at Essen, Germany. His itinerary included Hamburg, Berlin, London, Glasgow, and Paris.

Tail Shaft Lubrication

ON four of the vessels which are now being converted from steam to diesel propulsion by the United States Shipping Board, the propeller shafting is being fitted with Bethlehem-McNab Vista System of propeller shaft lubrication. These vessels are the motorships City of Rayville, Tampa, Unicoi, and Sawokla.

The Vista System is of especial benefit in the case of conversion of a steamer to diesel engine drive in that it permits a larger shaft diameter being fitted to the same stern tube. This system at the same time practically provides an oil bath in which the tail shaft runs, and efficiently excludes all grit or water from the tail shaft bearings and the stern tube bush. It is approved by all the classification societies and has been widely used in the merchant vessels of Europe for some time past. The system is patented and in America is manufactured by the Bethlehem Steel Company under license from Alexander McNab.

It will be of interest to West Coast readers that the Key System Transit Company's new ferryboats Peralta and Yerba Buena now nearing completion at the plant of The Moore Dry Dock Company, are fitted with this system.

J. A. Cranston

Pacific Executive Honored

J. A. Cranston, Pacific Coast Manager of the General Electric Company, and widely known among business executives of the country, was elected to the position of commercial vice-president of the General Electric Company at a meeting of the board of directors in New York, December 30. Mr. Cranston will, however, continue supervision of General Electric activities on the Pacific Coast, with offices in San Francisco, which position he has held since 1923.

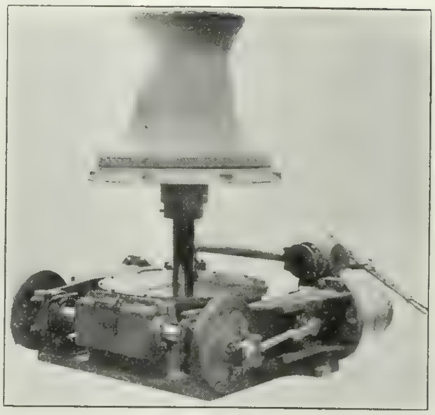
Since 1888 Mr. Cranston has been identified with the electrical industry, beginning his activities during that year with the Thompson Houston Company. He was formerly Northwestern manager of the General Electric, with offices in Portland, and was located in that city for several years.

Notable Auxiliary Installation

THE three combined passenger and freight steamers Chatham, Fairfax, and Dorchester built in 1926 by Newport News Shipbuilding & Drydock Company for the coastwise service of the Merchants and Miner Transportation Company of Baltimore, are equipped with steam steering gear, steam windlass, and steam warping gypsies supplied by the Hyde Windlass Company of Bath, Maine. These auxiliaries are functioning with great efficiency to the satisfaction of owners and officers of the new steamers.

The windlass is of the steam spur geared type with capstan connection, the capstan located above deck on the windlass, the capstan being provided with hand bars so that the windlass can be operated by hand in case of emergency. The wildcats of this windlass are fitted for handling 2-inch chains, the engine is double 9 by 10 of the reversing type; large warping heads are fitted on the intermediate shaft of windlass. The brake bands on the wildcat are controlled from either capstan or windlass deck by means of hand wheels.

The steering gear is of the right and left hand screw type, supported in two pedestals with connecting links connecting to the rudder crosshead. The engine is to be double 9 by 9 located immediately forward of the screw gear, and connected to the screw shaft by a flexible coupling. The engine is fitted with follow-up mechanism controlled by means of the Hyde hydraulic telemotor from pilot house. Provision is also made at the steering engine for controlling valve of steering engine direct. Hand steering is provided by means of a large steering column on top of the after deck house fitted with large mahogany steering wheels, the shaft from the stand connecting through gearing to the forward end of the screw shaft of the steering gear.


Hyde warping capstan

The warping capstan consists of a large gypsy about 18 inches diameter in the smallest part of barrel, supported in a substantial base secured to the deck, shaft from gypsy extending to the lower deck connected to worm gearing enclosed in an oil-tight case. The engine driving the gear is a double 9 by 9 of the reversing type.

Ray Burner Economy

SOMETHING over a year ago Ray oil burners were installed on the steamer Stanley Dollar. The engineers of that vessel say that these burners are the best they ever handled and that during the long service not a cent had been spent for replacements or repairs. In the matter of efficiency, too, the Ray burner has shown a saving of 10 per cent in fuel and has given equal or better speed than the kind it displaced.

Discussing further the many advantages of the Ray type of burner, an engineer told a Pacific Marine Review representative that its flexibility was wonderful. Without trouble, and with the least amount of manual effort, the heat of furnaces could be quickly and closely regulated from delivery of several thousand horsepower to the engines down to dead slow and stop, with hardly perceptible fluctuation of steam pressure. One most remarkable thing they say of the Ray burner is that the tips do not need cleaning because they never foul. It is claimed that these burners have run constantly for twenty-three days without other attention than oiling the driving mechanism.

The engineers are equally enthusiastic over the fact that the Ray burner handles fuel oil straight from the tanks. No oil heaters are needed. Besides being able to take care of cold fuel, this burner will readily consume a high percentage of water with the oil. Even as high a quantity of water content as 7 per cent can be handled. As water does get into fuel oil at times in spite of all precautions, this feature would seem to be a valuable one for marine men to consider.

In addition to the Stanley Dollar's engineers, who as a unit speak highly of the installation on board their vessel, the same good opinion obtains among the men of other steamers that are using Ray oil burners. One of these men mentioned the fact that as no forced draft machinery was necessary with the Ray burner it made things easier, as every additional auxiliary is a potential source of increased work and worry for the engine room force and increased operating expense for the owner.

The Ray burner is self-contained and its power factor is remarkably low. The rotating effect is produced by a small steam turbine which drives the oil distributor and the air pressure fan. The combination is said to be practically fool-proof and stands up after long service with little or no attention.

The engineering staff of the Katherine Luckenbach are most enthusiastic regarding the Ray burners in that vessel. In fact, in interviews with the engineers of several steamers using this system, not an adverse comment has been heard.

Ray burners are manufactured in San Francisco by the W. S. Ray manufacturing Company, who are represented by responsible agents in all the principal ports of the United States. This company has recently established large down-town show rooms at 170 Sutter Street, San Francisco, where a complete line of Ray oil burning equipment will be on exhibit under actual operating conditions.

New Automatic Welder

WELDING heavy plates automatically at approximately ten times the speed which can be obtained with the single-arc manually controlled process is now possible with a new automatic arc welder announced by the General Electric Company. The new machine bears the designation Duo-Arc automatic welder and consists of a standard travel carriage on which are mounted two automatic welding heads and two reels of electrode wire. With this equipment, the manufacturers claim, the operation is just as simple as that of the single arc travel carriages. One attendant can supervise the two welding arcs as easily as he can one arc.

The new welder is of particular value in butt welding heavy plates. This is accomplished by two electrodes working one behind the other simultaneously. Thus the necessarily large quantity of metal required to fill up the seam is deposited in practically one half the amount of time which would be required for the travel of one electrode.

The ordinary method of depositing the required thickness of metal in welding heavy plates is to weld twice with a single electrode over the same seam.

By using two electrodes, welding simultaneously, the time required to repeat the welding with a single electrode is saved.

An electrode larger than ¼-inch in diameter is not commonly used for high grade work because the deposition of metal cannot be accurately controlled and it is inconvenient for operators to handle the large amounts of electrical energy necessary, concentrated in a single arc.

For welding ½-inch plate, the seam is prepared by beveling to an angle of 30 degrees, total opening. With 3/16-inch electrode and approximately 250 to 300 amperes in each arc, a speed of welding of from five to seven inches per minute may be obtained.

Cutting Metals Under Water

This article is extracted from a paper read before the recent International Acetylene Association Convention at Chicago by L. F. Hagglund, of the Under Water Metal Cutting Corporation, New York City.

For metal that must be cut accurately under water there has been for years the hacksaw, chisel, and drill spurred on by the right hand and arm of a diver or by compressed air. These tools sufficed until the period of the World War.

At that time, with the increased volume of shipping menaced by an ever increasing number of submarines, wrecks of steel vessels became numerous. Accordingly marine wrecking or salvage received an incentive in this volume of work to develop new and better methods. One need was that for a rapid and reliable underwater metal cutting tool.

The oxy-acetylene torch had come into its own for cutting and welding metals above water and at first efforts were made to adapt this torch for work under water. Records and reports show that on several jobs fairly good results were obtained in limited depths. In practically all of these cases an ordinary oxy-acetylene torch was used together with some means or apparatus to displace the water from the immediate vicinity of the cutting flame and the metal where it was acting. The difficulties encountered were numerous, the surrounding water pressure, the increase in this hydrostatic pressure with depth. In sea water this amounts to approximately ½ pound per foot or about 45 pounds in 100 feet of water. Another difficulty is that at times it is actually impossible for the diver to see what he is doing and must rely solely on his sense of touch. Aside from these things each job presents its own particular handicaps, a strong tide or river current, extreme cold, the presence of concrete or heavy paint on the metal, concrete in the interlock of steel piling or a short diving time in great depths. Almost a new problem on every job.

The old Merritt & Chapman Derrick & Wrecking Company in New York understood the problem and looked at it from the diver's viewpoint. One of their men suggested the possibility of using a jet of ogygen upon metal heated by the electric arc under water. As a marine wrecking company they had a fairly constant though limited demand for such a tool and as a result of this suggestion, their own engineers and divers conducted experimental work along this line. They first believed that the heat of the arc alone could be used to cut metal under water. However, owing to the enormous quantity of water in contact with any submerged metal, as in this case of a sunken hull, the heat generated by the arc at any one point was rapidly dissipated and the instant the arc was moved away the molten metal solidified—usually solidifying in the cut, reuniting the metal. This made it extremely difficult if not impossible to make a continuous cut under water with the arc alone.

To overcome this difficulty and achieve a continuous cut, a jet of oxygen was combined with the arc. A carbon electrode containing several gas tubes was used. Through these tubes oxygen under high pressure was forced directly onto the metal where the arc was drawn.

This combination of the electric arc with oxygen accomplished the desired results. It was possible to cut metal under water; to cut any metal under water and at any divable depth. The depth of water does not effect the arc and an increase in depth simply means an increase in pressure at which the oxygen gas is supplied.

Subsequently during the salvage operations conducted on the s.s. St. Paul sunk in New York Harbor in 1918, Ralph E. Chapman and John W. Kirk took out a patent on a method for cutting metals under water. This method combines the heat of the arc with the oxidizing effect of a stream of oxygen under high pressure.

The under-water cutting apparatus consists of a generating unit, switchboard, and resistance, a supply of oxygen, oxygen gauge and hose, and the double conductor hose through which both oxygen and electricity are carried to the torch. The torch itself consists of a carbon electrode 12 inches long clamped into a brass holder at one end. Extending through this electrode are two copper tubes. At one end these tubes are also clamped in the brass holder and at the other they terminate at the tip of the electrode.

When the diver strikes an arc with this torch under water the oxygen is released through the arc and forced upon the molten metal. Cutting starts immediately and the speed possible depends upon the current available and the facility with which the diver can work. And the latter depends upon the job.

In one instance during the early part of 1926 a quantity of steel sheet piling was to be cut at a depth of 20 feet. When the diver was actually on the job it was found that even in 20 feet of water these steel piles were covered with 12 inches of ice along the desired line cut. This ice had formed when the river was low and remained on the piling when the water rose. It then became necessary to remove this ice before the piling could be reached.

In another instance where only 32 feet of ½-inch steel plate was to be cut, it was found that owing to the quantity of mud and silt in the river, the diver was unable to see the work he was doing or even the electric arc itself at any time during the entire operation.

To date steel plate, sheet piling, cast steel, cast iron, copper, and brass have been cut in depths of water down to 120 feet.

To meet a limited but important demand for under-water metal cutting apparatus complete apparatus and skilled diver operators are carried on hand by the Merritt, Chapman & Scott Corporation and can be furnished on short notice for work anywhere in the United States.

John Crane Packing

A PRACTICAL knowledge of maritime affairs is necessary to enable a man to intelligently mix and do business with those who buy and use goods essentially marine. And this knowledge also serves well even though contact is commercially with materials far removed from the traditions of the sea. It is of record that among the best salesmen of machinery specialties, such as packing, paints, and hose, a large percentage are those whose earlier life has been passed either in the building of ships and engines or the operation of them.

Graham Smith of San Francisco stands out as an example of this fact. Mr. Simth, born in Chicago, is the West Coast representative of the Crane Packing Company of that city. His headquarters are at 616 Mission Street, San Francisco, and he is very closely associated with the Pacific Mill & Mine Supply Co.

Graham Smith has had years of experience in marine and mechanical work. He served in the U. S. Navy during the Spanish-American War as machinist's mate, first class. He was honorably discharged from the service, and for many years was engineer on steamers out of San Francisco with the old Pacific Mail under Bill Chisholm. Besides this, he was engaged shoreside on several installations of machinery and later joined the Crane Packing Company as salesman, working up to his present position.

Smith is naturally sold on the specialties he handles and takes great pride in the fact that the users give repeat orders for the goods, showing their excellence. Especially does the soft flexible type of John Crane packing appeal to those who desire a reliable and lasting job. In this connection it is notable that the new river steamers, Delta Queen and Delta King, soon to go into commission for the California Transportation Company, will have all auxiliaries packed with John Crane soft flexible metallic packing. As in each of these steamers there are thirteen pumps besides the generating sets, steering engines, hoists, etc., a considerable quantity of the material will be used. Mose Barker who looks after the waterfront end of Pacific Mill & Mine Supply Company's business, landed the order for the equipment of the finest stern wheel river steamers ever built in America.

Cory Fire Alarm Systems on Steamers Lee and Washington

THE steamers Robert E. Lee and George Washington, constructed by the Newport News Shipbuilding & Drydock Company for the Old Dominion Steamship Company, and now owned and operated by the Eastern Steamship Company, are to have additional fire detecting equipment installed before these ships are placed in commission for the winter season.

Chas. Cory & Son, Inc., have been directed to equip all the holds and cargo spaces with the latest type Cory electro-pneumatic fire detection system. This system consists of a number of electro-pneumatic thermostatic units located throughout the compartments to be protected, connected electrically to a pilot house annunciator, with additional alarm in the engine room.

These installations are to be made without interfering with the regular sailings of the ships and are further illustrations of the efficiency of Cory service to ship operators.

The extension of the Cory fire alarm systems originally installed by the Newport News Shipbuilding & Drydock Company in the passenger quarters to the cargo holds is in line with the policy of the Eastern Steamship Company in providing on its ships the very latest and approved devices for the comfort and safety of passengers and crew.

Trade Literature

Nickel Steel Data and Applications—A series of 8½ by 11-inch technical bulletins is being distributed by the International Nickel Company, 67 Wall Street, New York City. The following nine bulletins have been issued to date:

Nickel Steel Bulletin No. 1—"Society of Automotive Engineers Standard Specifications for Steels." From the report of the Iron and Steel Division; 4 pages.

A description of the S. A. E. system of specifications for chemical compositions, chemical properties, finish, inspection and rejection for the various standard rolled and cast steels.

Bulletin No. 2—"Physical and Mechanical Properties of Nickel Steels." From Bureau of Standards Circular No. 100—"Nickel and Its Alloys"; 8 pages.

A brief summary of the principal effects of the addition of nickel to steel with notes on tensile properties and applications of the forging and structural grades of nickel and nickel chromium steels. Tensile, magnetic and electrical properties of high nickel steels, or ferro-nickel alloys, with data on their thermal expansivity are also given.

Bulletin No. 3—"Heat Treatment and Applications of Nickel and Nickel Chromium Steels." From Handbook of American Society for Steel Treating; 12 pages.

Details on the heat treatment of the standard nickel and nickel chromium steels, with notes on the properties developed and their more important industrial applications.

Bulletin No. 4—"Making Steel Castings Stronger"; 8 pages.

An analysis of the effects produced by the addition of nickel chromium and other alloying elements to steel castings with instructions for making the additions and data on cost, heat treatment and commercial applications.

Bulletin No. 5—"The Mill Inspection of Steel"; 8 pages.

A description, in elemental detail, of the processes of manufacture of rolled steel, from raw material to final inspection, with details on the inspection at each stage and definitions and descriptions of common defects.

Bulletin No. 6—"Alloy Steel Reduces Die Block Costs;" 4 pages.

Comparative costs of producing commercial forgings with carbon steel and nickel chromium steel die blocks with tabulation of savings effected and advantages derived by the use of the alloy. Figures submitted are based on production records of a large job forging plant producing principally automotive castings.

Bulletin No. 7—"Automobile Design and Automotive Steels"; 12 pages.

An analysis of the factors influencing the design of the modern motor car and the selection of suitable steels to be used in its construction, with typical calculations illustrating the methods used to determine stresses and factors of safety in various automotive parts.

Bulletin No. 8—"Improving Gray Cast Iron with Nickel"; 12 pages.

A brief presentation of all essential information required by the foundryman, metallurgist, or engineer, with tables, illustrations, commercial applications and instructions for making the nickel addition.

Bulletin No. 9—"Physical Properties of Nickel and Nickel Chromium Steels"; 16 pages.

A compilation of curves showing the average values of tensile strength, elastic limit, reduction of area, elongation, and Brinell hardness, at various drawing temperatures, for the S. A. E. Standard Nickel and Nickel Chromium Steels. Tables of the maximum and minimum values of these same properties reported by various authorities are also given.

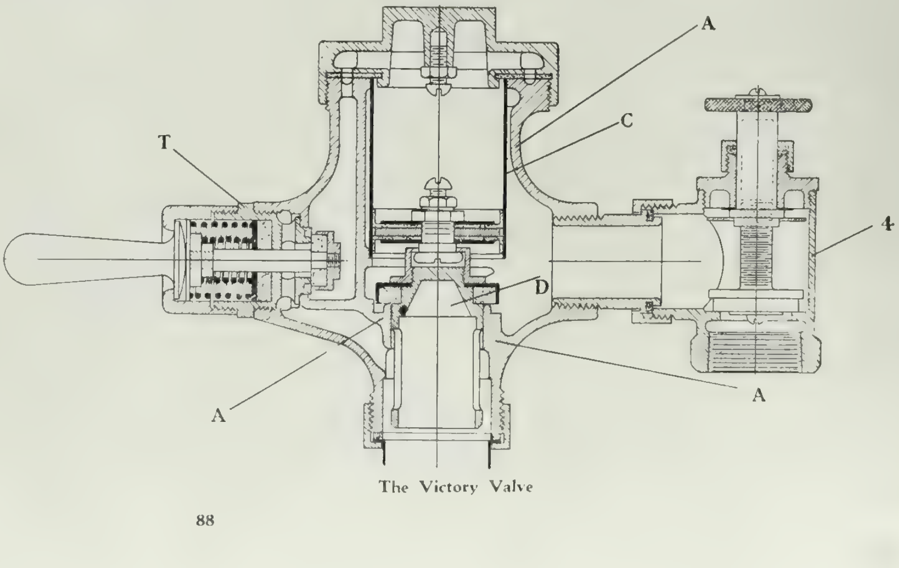
The Victory Valve

A SATISFACTORY flushing valve for toilets that is self-cleaning and practically eliminates all valve troubles has been developed by the Handy Self-Cleaning Flush Valve Company of San Francisco.

This valve is known as the Victory self-cleaning flush valve. We present herewith a cross sectional elevation of this valve, by reference to which it is easy to trace the method of operation. A slight movement of the hand lever operates the by-pass relief valve "T," allowing water and air to escape from the inner chamber and by-pass into the bowl. This throws the piston operating the main valve off balance, causing the piston to raise and open the ports of the main valve, permitting the full flow of water to pass through.

The passage of the water is through the stop valve 4 into the ports of the main valve D. As this stream impinges on the lower side of the brass liner of the piston cylinder, a portion of the water is directed up and around this liner with a rotary motion, which forces the water into the inner chamber through a small port at the upper end of the liner and thereby builds up sufficient pressure inside the liner to force the piston down and close the valve. The rotary action of the water scours the surface of the liner at high velocities and keeps it clean from the accumulation of dirt.

The Victory valve is manufactured by the Handy Self-Cleaning Flush Valve Company of San Francisco and has been installed on a number of passenger and freight ships on the Pacific Coast. The valve is handled in San Francisco for the marine trade by Hough & Egbert, Inc.



The Victory Valve

Fire Protection on E. T. Bedford

By T. J. Kauffeld, Engineer

IN equipping the newly converted 9560-ton tanker E. T. Bedford with the Lux fire extinguishing system, the Standard Oil Company (N.J.) is again indicating its firm attitude of protecting the lives of its employees.

Too often, of late, do we read of disastrous explosions and resulting fires on board inadequately protected oil carriers. Once started, the spread of flame is so fast that unless the fire is extinguished immediately after the first explosion others soon occur in rapid succession and the vessel becomes a raging furnace. No possibility of escape remains for the maimed and injured. The trend in late years has been increasingly towards providing proper fire protection. Not only are many lives saved but great property damage is eliminated as well. After years of test and research work, engineers have been forced to acknowledge the advantages derived from the use of an inert gas as a fire extinguishing medium. The most practical, commercially, has been found to be carbon dioxide, which is employed in the Lux system.

The carbon dioxide cylinders are located in some protected space and manifolded together in batteries. Each Lux cylinder is provided with a special valve and quick release mechanism permitting the discharge of any amount of carbon dioxide necessary to extinguish a fire in less than thirty seconds. Release is accomplished by remote control. The carbon dioxide is conveyed through pipes to the space afire and ejected through special nozzles. Freezing up of the carbon dioxide changes instantaneously to a gaseous state and expands 450 times its original stored liquid volume.

Boiler and engine room fires are instantly extinguished with Lux. Fires at all levels, in the bilge, on floor plates, shelves, or in the trunks are easily handled with no risk of life by the person controlling the extinguishing system. It must be remembered that all hand applications are limited to the ability of the operator to stay and use them. When these combatting means have been exhausted, then for such large fires, the Lux system of general flooding should be used. There is no need to close ventilators, ports, or other openings. Moreover there is no residue and the gas is removed by natural ventilation.

However, it is not necessary that oil fires be confined in spaces to extinguish them with pure carbon dioxide. Lux extinguishes oil fires in open tanks exposed to severe wind. The application of the carbon dioxide is so rapid as to virtually lift the fire from its source. A few seconds only are needed for complete extinction.

The E. T. Bedford is Lux protected throughout, 118 Lux cylinders being installed on the upper deck in banks of 10, 11, and 12, depending on the spaces protected. Control of the system to extinguish fire in any part of the ship is embodied in a set of pull handles located in the aft passageway on the bridge deck.

Each control handle releases a bank of cylinders directly connected with the cargo oil tank as indicated on its name plate. In case of motor or pump room fire it is first necessary to close valves whose stems extend through to the shelter deck and which are in the tank lines, open direction valve of space afire, and pull the control handles of a number as noted on the instruction chart.

The Lux system is approved by the U. S. Steamboat Inspection Service, American Bureau of Shipping, and the British Board of Trade. Moreover it is manufactured by Walter Kidde & Company, Inc.—an engineering organization trained in fire protection.

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The Most Important Thing In Welding

FROM a paper read before the International Acetylene Association Convention at Chicago on November 11 by S. W. Miller, consulting engineer of the Union Carbide and Carbon Research Laboratories, Inc., we extract the following very pithy remarks on the above subject.

Fusion welding is in no way different from any other operation, because any operation can be either a success or a failure. It is true that the manipulation of the welding blowpipe is different from that of a lathe or other machine, but the same principle underlies both operations. Stated briefly, it is that the procedure used must be correct if success is to be desired, and it is at once evident that as procedure involves a number of elements, each one of them must be correct if the process is to be successful.

Procedure involves everything that has to do with the making of an article, and, in general, the following elements may be considered as essential to procedure, regardless of what is being made: (1) Design, (2) materials, (3) methods, (4) operators, (5) supervision, (6) tests.

1. **Design.** This must be such as will enable the welder to weld easily and cheaply and to do good work. Designs suitable for other forms of joining than welding are frequently very unsuitable for welding, and it is necessary for the designer to forget the other types of joinings and to learn to use those suitable for welding.

2. **Materials.** These must be such as will result in clear, sound welds, so that both the base metal and the welding rod must be selected with this in view. Also the welder must be considered, because while he may be able to use materials that are hard to weld, and while it might be necessary in some cases to do this, yet for general work this should be avoided, and materials should be selected accordingly.

3. **Methods.** This refers particularly to the use of suitable jigs, fixtures, clamps and other tools and to the order and way in which the various parts of the whole operation, including the preparation and finishing, are performed. Any of these things that make it easier to get better work are an advantage, and each design should be studied with this in view.

4. **Operators.** As in all other cases, much depends on the operator, but if he is handicapped by improper design, materials, or methods, the best results cannot be expected, no matter how good he is. I disagree with the idea that the operator is the most important link in the chain. I do not think that any one of the items mentioned is of superior importance to the others.

5. **Supervision.** As in any other work, competent and careful supervision is necessary and the supervisors must be competent to perform their duties. The supervisor should know not only the actual welding operation, but all other parts of the work.

6. **Tests.** A weld cannot be inspected internally to determine its quality, but it has been amply demonstrated that tests can be devised that will prove the integrity of the welded structure, provided the other links in the chain receive the proper attention.

Procedure control in welding has show its value in many cases not only in better work, but in reducing the cost and increasing the production. I strongly believe that it is the most important thing in welding.

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Heavy Forgings

ALBERT W. Lawson of San Francisco has recently been appointed California agent for the Isaacson Iron Works of Seattle.

This firm makes a specialty of heavy forgings. According to Mr Lawson, they are perhaps the largest producers of this type of work on the Pacific Coast and execute large orders from points in the Middle West and even as far as the Atlantic Coast. They have a most modern and complete plant, with two heavy hydraulic presses and eight steam hammers, giving them a large capacity and making possible prompt deliveries. A large stock of standard parts, clips, and bolts is kept on hand, so that orders for such materials can be promptly filled, and any special type of deck or spar fitting can be made up promptly in quality and workmanship to suit the most exacting customer.

Plibrico Flexo-Anchor

THE flexo-anchor is a device that allows a one piece monolithic furnace wall to move in any direction with expansion and contraction, providing for the difference in expansion and contraction between the common brick and the refractory lining; and at the same time it anchors the refractory to the common brick wall, effectually preventing bulging. It has just been announced by the Plibrico Jointless Firebrick Company of Chicago, manufacturers of plastic Plibrico furnace lining.

Three years ago the rigid anchor was introduced by the same organization. Three years of use under boilers of all types proved the rigid anchor to be a big step ahead in monolithic practice. The flexo-anchor is a further refinement and development which brings the additional advantage of allowing for expansion.

The new anchor is a very simple device. The hook is secured in the common brick wall. Then as the wall of plastic Plibrico is built up the anchor is placed over the hook. As the wall rises the anchor is embedded in the Plibrico.

This new anchor is used in both new settings and repair jobs. On old brickwork a brick is pried loose. Then the hook is inserted into the wall and the brick is firmly wedged back into place.

Each drum of jointless Plibrico furnace lining shipped out now contains a flexo-anchor under the head. The Plibrico Jointless Firebrick Company point out that since the anchor is an exclusive Plibrico development, the dual advantage of free movement plus effectual anchoring cannot be secured with any other plastic nor with ordinary laid-up firebrick. The flexo-anchor is fully described an dillustrated in the new 36-page Plibrico catalog, "Cutting Furnace Costs," which came from the press the first of the year.

Reclaiming Circuit Breaker Oil

AT a cost of approximately a cent and a half a gallon the Sharples reclaiming process purifies contaminated circuit breaker oil and maintains the oil in condition to assure the safe operation of the oil circuit breakers, thus protecting the feeder system.

The operation of this apparatus is simple and requires the services of only one man. The contaminated oil is pumped from the supply source at the rate of 150 gallons per hour through four 6000-watt heaters to a 50-gallon mixing tank, where it is thoroughly mixed with the first reagent with the aid of a motor-driven agitator. The resulting emulsion is fed into a supercentrifuge. The separator discharges the waste water containing some of the impurities, the solid impurities remaining in the bowl of the machine. The mixture is then treated with a second reagent in the second mixing tank and sent to a second super-centrifuge, and from there the purified oil is pumped to storage. This process may be intermittent or continuous according to the requirements of the station.

The advantages of producing thoroughly purified oil of high dielectric strength from contaminated oil and the effective and inexpensive recovery of oil, with the assurance that it will render as effective service as the original new oil, make this new Sharples process reliable, economic, and efficient, and a boon to the electrical industry in which greater and greater service is being imposed on oil circuit breakers.

(Westinghouse Technical Press Service.)

Flashing The Whistle

THE steamer Matsonia has recently been equipped with a Benson electric flasher. She is the first of the vessels on the Pacific Coast to have such an installation, though several hundred Great Lakes and East Coast steamers are so fitted. The Benson flasher is primarily a large cluster of brilliant electric lights fixed aloft and arranged to blaze out when the whistle is blown. It is claimed that the flashing of the lights is a big factor in safe navigation, especially at night or in hazy weather, or when other noises might drown the sound of the signal whistle.

The flashing lamps can be worked into any desired form, generally a design showing the company house flag, thus enabling other boats to identify the signalling ship. Nearly all steamships nowadays are fitted with an electric automatic whistle operator, and all motorships have the same arrangement for air whistles. On such ships the addition of the flasher is only a matter of detail. However, it can be installed in any vessel and with different methods of operation. That it is a factor of safety is shown from the fact that the United States Board of Supervisors have passed it for use on steamers. It is also highly recommended by those who have used it. Edgar S. Ayers, of San Francisco, distributes the Benson flasher to Pacific Coast shipowners.

A Good Maintenance Record

THE Southern Pacific double-end screw, steel hull ferryboat Berkeley, operating on San Francisco Bay, was built at the Union Iron Works in 1898. Her engines are tripple expansion, 22 by 34 by 56 inches, with a stroke of 36 inches. Her boilers were two in number of Scotch marine type, 10 feet 10 inches diameter, 18 feet 11 inches in length, double-ended, with four furnaces each and with a working pressure of 165 pounds. For twenty-eight years this vessel has steadily ferried back and forth between San Francisco and Oakland and never had an accident or any extensive repairs. This record is characteristic of Union Iron Works workmanship and Southern Pacific maintenance. During this period the Berkeley has traveled about one and a half million miles and carried about 150,000,000 passengers.

Recently, however, her old boilers were taken out and replaced with water-tube steam generators built by the Babcock and Wilcox Company. Higher steam pressures are now carried, 180 pounds to the inch being allowed. While these new boilers were being installed, the engines were reconditioned, though this work was not extensive. The hull, too, was thoroughly overhauled; but here little was found necessary in the way of renewals; scraping, painting, and cleaning being the principal work. After being reconditioned, the Berkeley was put on her run again. Trials showed that she could make better speed than when new, as her engine revolutions could be maintained at 128 per minute, although 112 had been standard.

It might be of interest to mention that the Berkeley was the first vessel on the Pacific Coast to have Interlocking Rubber Tiling used as a deck covering, and that this material after twenty-eight years' severe wear is still in place, showing but slight evidence of the scuffling of millions of feet during that time, and has needed no repairs or replacements of sections.

Automatic Valve For Telemotors

THE reliability and efficiency of any telemotor gear is dependent on the absolute accuracy of operation of the equalizing valve at the hydraulic transmission cylinders in the pilot house. Being alive to this, the staff of the American Engineering Company of Philadelphia have brought out a valve to be used on all types of their telemotors which, it is claimed, solves the difficulties formerly experienced with manual valves. This new valve is automatic in action, maintaining full cylinders and equalizing without trouble. Particularly is this feature of importance when the Sperry "Metal Mike" is used, as with the new valve the fluid in the system is automatically replenished and kept solid.

This valve is so designed that all pressures are below the valve seats, and not on the stems, thus eliminating all troubles from leaks around stems under pressure and the probability of sticking stems when tightened enough to stop such leaks. These improved valves can be placed on any model of the American Engineering Company's telemotor with very little trouble.

Marine Insurance

Edited by JAMES A. QUINBY

The Moral Hazard in P. and I. Policies

PROTECTION and indemnity insurance, according to our text books, is designed to protect the shipowner from all liability which he may incur by reason of his ownership or operation of the insured vessel. This sweeping classification includes damage to cargo, damage to wharves or other structures, and loss of life or personal injury to seamen, passengers, or others.

It may include other and less ordinary items. A master of an American vessel on the West Coast of South America had the ill luck, a few years ago, to pass away while his ship was in a Chilean port. In order to maintain the prestige of the flag and the reputation of the line, the owners had the defunct skipper buried with all the customary trimmings, including a marble headstone and a brass band. After some hesitation, the P. and I. underwriters paid the whole bill.

The writer recalls a case last year in which a vessel proceeding down a tributary of San Francisco Bay fouled a cable. The cable dragged the abutments from under a house on shore, and the P. and I. insurers on the vessel came through and stood the cost of repairs, including an item for tuning a piano that had suffered from the shock.

And since it is the legal liability of the shipowner which is underwritten, the extent of the loss ratio is just as indefinite as the extent of coverage. The same accident may render a shipowner liable in one jurisdiction and fail to affect him in another. Or he may be liable in both jurisdictions, get off lightly in one, and be saddled with heavy damages in another due to the enthusiasm of a jury.

Of late years, American courts, and particularly American juries, have been spending P. and I. money at a rate that puts the proverbial ossified mariner to shame. Our English cousins, who are hardest hit by this open handed generosity, insinuate that the general prosperity of the country and the preeminence of the dollar have had much to do with this reckless attitude and cite instances where fabulous awards have been obtained for minor personal injuries. As a natural result, the price of good protection has increased and the limited coverage has become common, to the detriment of the market in general.

From these casual remarks on the nature of the P. and I. business, it must appear that the liability underwriter must have a lot of the Steve Brodie in his makeup.

In comparison with other forms of coverage, P. and I. insurance has been in general use but a short time. Under the mutual club system largely used in England, legal recourse is prevented by agreement. As a general result of these factors, there is a dearth of decisions on this important branch of insurance, and liability underwriters have, until recently, been somewhat in doubt as to the interpretation of their own policies.

It has always been assumed that a P. and I. policy had numerous points in common with an ordinary marine policy. It is, of course, elementary that certain forms of ordinary marine policies contain implied warranties of seaworthiness, but it has been decided that no such warranty exists in a P. and I. policy.

The C. S. Holmes

In Geo. A. Moore and Co. vs. Eagle Star and British Dominions Insurance Co., 5 Fed. Rep. 2nd, 358, affirmed in 9 Fed. Rep. 2nd, 296, the facts were as follows:

In 1920, the schooner C. S. Holmes was libeled in New Zealand for damage to a cargo of benzine which had been shipped from San Francisco to New Zealand. Judgment was rendered against the ship on the ground that her drainage system was inadequate to carry off sea-water which had collected in a deck house.

Since the shipowner had, in his bill of lading, inserted a provision that he should be required only to use due diligence in furnishing a seaworthy vessel, the New Zealand court, by implication, found that he was guilty of a failure to use such due diligence.

In the principal case, the shipowner sought to recover back his loss as a claim under his P. and I. policy, which purported to cover, among other things, "loss or damage to any goods which may arise from any cause whatever."

The P. and I. insurers contended, (1) that there was a warranty of seaworthiness in a P. and I. policy, and (2) that the owner's failure to use due diligence amounted to actual fault and privity. In holding against these contentions, Judge Kerrigan of the District Court (California) commented as follows:

"Without going into the origin and purpose of P. and I. coverage, and avoiding any elaborate comparison of such a policy with an ordinary marine insurance policy, I think that for the purpose of this decision it is sufficient to point out that if a warranty of seaworthiness was implied into this policy, it would mean that in practically every instance the insurance company had assumed no risk, because, generally speaking, a ship is not liable to the cargo unless it is unseaworthy. Cargo improperly loaded, stowed, or ventilated, as a matter of law, renders the vessel unseaworthy. Obviously such a construction is to be avoided; otherwise, libelant would have paid premiums to no avail."

The court then went on to point out that the Harter Act allowed a shipowner to limit his duty of care to one of due diligence, and that there is a clear distinction between

Ditties of Despair

Number II.

THE CARGO CONSIGNEE

(A tall, cadaverous man enters from left, carrying an empty sack. He always gets left, anyway, so he may as well enter from there.)

Sings mournfully:

Others collect the premiums,
Others collect the freight,
But I collect the dirty digs
And all I get is the gate.
For the ship has many defenses
And so has the polic-e-e-e-e-
But I spend my days like the woman who pays—
I'm a cargo consignee.

Arthur M. Brown **EDWARD BROWN & SONS** *Arthur M. Brown, Jr.*
MARINE DEPARTMENT—*Harry W. Browne, Manager*
PACIFIC COAST GENERAL AGENTS
THE GLOBE & RUTGERS FIRE INSURANCE CO., INC.
200 BUSH STREET, SAN FRANCISCO

FIREMAN'S FUND
Insures Hulls, Cargoes,
HEAD OFFICE: CALIFORNIA and SANSOME

JOSEPH HADLEY,
European Agent
3 LOTHBURY, E. C
LONDON

E. A. VALENTINE, Resident Agent for Oregon
714-715 BOARD OF TRADE BUILDING
PORTLAND, ORE.

FRANK G. TAYLOR, MANAGER, PACIFIC NORTHWEST BRANCH

actual fault and privity and the failure to exercise due diligence. His conclusion was that the owner of the C. S. Holmes, while guilty of the somewhat passive sin of omission, could not be deemed an active accomplice in the unseaworthiness.

The Holmes case, and certain English cases preceding it (notably the Argo, VI Asp. Mar. Cases, 130), clearly establish that no warranty of seaworthiness exists in a P. and I. policy.

The Sorenson Case

While the Holmes case contains a dictum to the effect that any fault or privity of the owner to his vessel's unseaworthiness would defeat recovery under a P. and I. policy, the question did not come squarely before an American court until January, 1925, when the United States District Court for the District of Maryland handed down a decision against the assured in the case of the Sorenson and Neilson vs. Boston Insurance Co., 1926 A. M. C. 241.

In that case a lighter belonging to Graham & Co. sank in Baltimore harbor, solely by reason of unseaworthiness, and damaged a quantity of cargo. Graham & Co. became bankrupt, and this suit was brought by cargo owners under a liability policy carried by Graham & Co. which covered risks similar to P. and I. risks, for the account of "the assured, as owners, common carriers, forwarders, bailees, custodians, or otherwise, and is also to cover on account of all such owner or owners of the property transported. . ."

Graham & Co. had previously been refused the right to limit liability. In suits by the cargo owners, it was determined that Graham & Co. was solely responsible for the accident, and that the lighter was unseaworthy to the privity and knowledge of William A. Roberts, the president and general manager of Graham & Co.

At the outset, then, it conclusively appears in the Sorenson case that not only was the vessel unseaworthy, as in the C. S. Holmes, but that she was unseaworthy to the privity and knowledge of the owner. On this state of fact the court held that no recovery could be had under the policy, saying that in the Holmes case they considered "whether the ship was unseaworthy with the actual fault and privity of the owner, for it was conceded that if this were the case, there could be no recovery."

The court in the Sorenson case then goes on to admit the nonexistence of a warranty of seaworthiness in a time policy, in a statement qualified as follows:

"But even in the case of a time policy under the English law, a full disclosure at the time of its execution of facts pertaining to the seaworthiness of the vessel is requisite; 38 Corpus Juris 1054; and. as we have seen, the policy is avoided if the owner, with privity, sends an unseaworthy ship to sea.

"No reason suggests itself why the insurer in a maritime liability policy is not entitled to similar protection when the insured is guilty of like default. Although the policy is framed to indemnify the insured from losses due to his neglects, it is not the purpose to protect him when with privity or knowledge, he assumes a risk repugnant to the very nature of the business. Considering the absolute obligation of the carrier in the ordinary case to furnish a seaworthy ship, whereby he becomes an insurer in this respect of the goods taken on board, a marine liability policy is in the nature of a reinsurance of the risk, and the principles of reinsurance may be applied. It is well settled that where an existing risk is reinsured, nothing should be done by the reinsured without the consent of the insurer to alter substantially the nature or extent of the risk whereby the reinsurer may be prejudiced or his liability increased; and such an act will avoid the policy or contract of insurance. . . . If the insured in a liability policy sends out a ship with privity or knowledge of her insufficiency, he substantially alters the nature of the contemplated risk, increases the normal liability, and thereby vitiates the policy."

The T. W. Lake Case

The Sorenson decision was handed down in January, 1925, and the dust of conflict had hardly settled before a similar case arose on the Pacific Coast.

The T. W. Lake, a Puget Sound steamer, sank in a squall, causing the loss of all on board. From the appearance of the wreckage, it was plain that the vessel had disintegrated like a pasteboard box, and the representatives of deceased seamen promptly filed suit against the vessel owners. The owners countered with a petition to limit liability to the then value of the wreck and her pending freight. This petition was denied, and in an oral decision on the limitation proceeding, Judge Cushman of the District Court in Seattle left no doubt as to his opinion of the Lake's unseaworthiness and the owner's privity thereto.

"Well," he said, "I find that she was unseaworthy. Regarding the question of privity, part of what I have already said, at least so far as the decayed condition of the timbers is concerned, the knowledge of her age, knowledge of her being built on the bottom of the Anna M. Pence, which would necessarily weaken her along the knuckle-joints, the failure to exercise any watchfulness over her ordinary inspection to determine by boring or otherwise the character of her timbers, save from surface examination, what must have been visible to anyone who had even looked at the exterior of these timbers such as could have been easily seen, the fact of her tonnage having been cut down, as I said, and her power cut down, her frequency on the drydock, matters the owners knew, could not help but know, the general charatcer of her repairs, they must have known. They must have known that her bottom had not any planking put on it.

"The very fact that Mr. Marvin exhibited what appeared to be excessive caution in warning Captain Mason never to take any chances, never to go out, that, with the other evidence, I feel justifies the Court in concluding there was privity on the part of the corporation as to the unseaworthy condition of this vessel, and that her unseaworthy condition to visual inspection or ordinary inspection could have been readily observed by a person of ordinary skill."

After paying a substantial sum in settlement of the death claims, the vessel owners brought suit to recover under P. and I. policies which had been effected on the Lake two

INSURANCE COMPANY
Freights and Disbursements
STREETS, SAN FRANCISCO, CALIFORNIA

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ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

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weeks prior to her loss. These policies were issued in the United States and did not include the usual English exceptions. The P. and I. underwriters, relying on the Sorenson decision, contended that the privity of the owners, as evidenced by the decree in the limitation proceedings denied liability under their policy. To the casual observer, the issue thus joined was the same as the issue in the Sorenson case.

The case of the T. W. Lake owners against the P. and I. insurers was tried before a jury, and on March 19, 1926, a verdict was found for the plaintiff, and Judge Cushman rendered a decision in accord with the verdict, but without an opinion. It should be noted that the oral opinion in the limitation proceedings, from which we have quoted above, was declared inadmissable as evidence in the action on the policy.

The insurers carried the case to the Circuit Court of Appeals, which affirmed the District Court in a decision handed down on November 22, 1926. The opinion, in part, reads as follows:

"The differences between counsel arise largely from their different conceptions as to the nature of the contract involved. Counsel for the plaintiff in error contends that it is analogous to the ordinary marine policy and is controlled by the rules of law applicable to such policies, while counsel for the defendant in error contends that it is analogous to the ordinary indemnity policy and is controlled by the rules of law applicable to that class of insurance. While the two classes of insurance may have something in common, their objects and purposes are essentially different."

The court then goes on to say that damages for loss of life arising from the negligence of the shipowner is clearly within the coverage of an indemnity policy, and the courts will not attempt to distinguish between degrees of negligence, unless the negligence is so gross as to amount to a "wilful, deliberate, and intentional wrong."

Summary

The Sorenson case is on appeal to the Circuit Court of Appeals, and a decision there is being withheld pending the outcome of the T. W. Lake case. A petition for a writ of certiorari has been filed in the T. W. Lake case in an attempt to carry it to the Supreme Court of the United States.

The Sorenson decision, in effect, holds that where an owner has knowledge of specific unseaworthiness, which later causes loss, no recovery can be had under his liability policy. The Lake case holds that knowledge of a general state of unseaworthiness does not preclude recovery under a P. and I. policy carrying no exception for the privity of the assured.

If the cases can be distinguished on their facts, the distinction would appear to be based upon the varying degrees of guilty knowledge displayed by the owners.

In the Sorenson case, the manager of the owners knew of the specific, immediate item of unseaworthiness, i.e., a leak in the hull of his vessel while she was tied up at a wharf. In the case of the T. W. Lake, the items of unseaworthiness were so numerous that a knowledge of any one of them was perforce swallowed up in the general impression that the ship was a sieve and almost sure to go down in the first blow. This knowledge was available to all who took the trouble to investigate, and Judge Cushman probably thought that the insurers had as much opportunity as anyone else to find it out, and having accepted the premium, should take their medicine.

In any case, it is to be hoped that one of these cases gets to the Supreme Court. A ratification by that tribunal of the theory of the Lake case would clarify the issue, even though it might lead to an entire lack of responsibility on the part of negligent shipowners. An affirmance of the doctrine of the Sorenson case, or a reversal of the Lake decision, would certainly weaken the value of a P. and I. policy on every vessel over ten years of age.

Time to Sue Under Bills of Lading

THERE is no doubt that a carrier is entitled to demand that notice of damage to cargo be given within a reasonable time after delivery, and that suit to recover for such damage shall be filed before a lapse of time which might dissipate its defenses. So long as these periods are reasonable, however, their exact determination in this country is a matter of contract, and varies with varying bills of lading.

It can do no harm to emphasize at this point the extreme importance of strict compliance with these time provisions. Every consignee, broker, and insurer of cargo should prepare a form tracer in cases of damage, which should include prominently the following items:

1. Vessel arrived ....
2. Time for notice of claim expires: ....
3. Time to sue expires: ....

Examples of the sad results of carelessness in this connection are numerous. A good illustration is found in the case of the Hesperos, 1926 A. M. C. 1614.

In that case, the vessel's bill of lading bore a provision that notice of claim for damage or shortage should be submitted in writing before the removal of the goods. The clause as to suit read as follows:

"No suit or proceeding to recover for or upon any claim or demand shall be maintained against the carrier or vessels or owners thereof unless commenced within six months after the delivery of the goods by the carrier, and the lapse of such period shall be deemed a complete bar to recovery in any such suit or proceeding not sooner commenced."

The libelant's goods were short-delivered in some particulars, and their claim was filed against the carrier some time after delivery of the goods. The carriers' agent acknowledged receipt of the claim, and wrote the claimant that they were awaiting the decision of the vessel's P. and I. insurers as to payment.

While both parties were awaiting the action by the P. and I. people (the claimant in fact took the matter up direct), the time for filing suit under the bill of lading expired. The court held that the action of the carriers' agent was not such as to amount to a waiver of defense under

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the time to sue clause. The claimant here could very easily have preserved its rights by obtaining from the carrier a written extension of the time to sue, without discarding the chance for an amicable adjustment.

NORTH AMERICA INCREASES PERSONNEL

The Insurance Company of North America, which enjoys the distinction of being the oldest corporate underwriting concern in the United States, is reflecting a healthy spirit of expansion in its Pacific Coast marine branches.

H. J. McCauley, who formerly had charge of the company's reinsurance department at the head office in Philadelphia, has been installed as Pacific Coast Marine Manager, with headquarters at San Francisco. He has increased the San Francisco staff by the addition of George J. Schoenhair, late of Johnson and Higgins' Los Angeles office.

SEA FARIN STEVEDORES

"Well," said McGinnis the longshoreman, as he hoisted his quid to his starboard cheek and nonchalantly speared a sack of sugar with his hook, "I see by the papers that the Soopreme Court has decided that a stevydore is a seaman. I suppose the next thing they'll be callin' a recess on them five-hundred-dollar likker cases out in the attic of the Post-office, and takin' a day off to decide that a marine is a soldier.

"This 'ere suit in the Soopreme Court was between a stevedorin' company and a guy named Haverty. Ye' might know there'd be a fight with a guy named Haverty around. Well this chap Haverty figgered, just like you and me, that if you're on the well-known high seas, meanin' the Columbia River or the Oakland Estuary, your chances of gettin' anything respectable out of an accident was pretty slim. Ye'd get wages, maintenance, and cure, whatever that means, which is generally about enough to pay the first mortgage on a pack of cigarettes. Well, this sea gull Haverty has the court identify him as a seaman, and they say he's entitled to sue under the Merchant Marine Act, and have the whole thing tossed up in front of a jury, and as everybody knows, in front of a jury, them as comes down tails is mine and the others is yours.

"Anyhow, this jury looks things over and says yes, somebody is niglegent, and Haverty gets a big wad of jack. The next time I bump my skypiece on a hatch cover, you lissen to me bawl for a jury.

"Huh? Did you call me a cargo hoister? The nerve of the landlubber! I'll have ye know I'm no human winch. Shiver me timbers! I'm a sea-farin' man."

The British freighter City of Norwich ashore on the south side of Long Island, with Coast Guard crew and breeches buoy line ready for instant service. Oddly enough, this freighter, equipped with magnetic compass only, ran on a shoal bar directly opposite the estate of Elmer E. Sperry, of Gyroscopic compass fame.

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Freights, Charters, Sales

January 21, 1927.

THE U. K. wheat market has not been active since the first of the year and tonnage is available for February-March loading at 36/3 to 37/6 without many fixtures to date. Liners are still securing 40/- up to the middle of March loading for parcels, although one or two have accepted 37/6 for round lots.

The Japan market is very dull with no new business and exporters do not look for any resumption of buying until after the late Emperor's burial.

Owners are not inclined to accept Australian lumber at present, although charterers are offering $13.50 to $14 for February to May tonnage.

There have been some charters made for intercoastal lumber, but this market should not be active until the Atlantic buyers use up the large amount of lumber in their yards which has been shipped on consignment.

The liners continue to take care of the business for East and West Coasts of South America.

Since our last report the following steamers are reported fixed with grain from the North Pacific to United Kingdom/Continent: Japanese stmr. Tenpaison Maru, Portland to U. K./Continent, 39/6, option Vancouver, 38/3, Jan., Balfour Guthrie & Co.; British stmr. Vulcan City, Vancouver to U. K./Continent, 37/6, Jan., Strauss & Co.; Japanese stmr. Jufuku Maru, Columbia River to U. K./Continent, 39/3, Jan., Strauss & Co.; British m.s. King James, Prince Rupert or Vancouver to U. K./Continent, 37/6, Jan.; Norwegian stmr. Golden Gate, British Columbia to London, 36/9, prompt.

The following fixtures are reported for grain to the Orient: Japanese stmr. Ryoka Maru, Vancouver to Shanghai, Jan. $4.75; Japanese stmr. Yogen Maru, British Columbia to Shanghai, Jan./Feb.

For lumber to Australia, the following steamers are reported fixed: Japanese stmr. Usuri Maru, North Pacific to Australia, Jan.; Japanese stmr. same, $13.75, Jan., American Trading Co.; British stmr Buchanness, Grays Harbor to Australia, Jan., American Trading Co.; Japanese stmr. Junyo Maru, Humboldt Bay and Grays Harbor to two ports Australia, $13.25, Jan., Canadian Trading Co.; American sh. Tonowanda, Columbia River to Adelaide, J. J. Moore & Co.

The following steamers are reported fixed with lumber to the Orient: Japanese stmr. Koshin Maru, Shanghai, Jan.; Japanese stmr. Fukuyo Maru, Shanghai, $10.50, Jan., Pacific Export Lumber Co.; British stmr. Canadian Winner, Japan, Jan., Canadian Transport Co.

Steamers reported fixed with lumber to the Atlantic are as follows: Japanese stmr. Tohsei Maru, Jan./Feb.; American stmr. Oneida, Jan. Feb.; American stmr. Lake Ormoc, same; American stmr. Florence Luckenbach, Feb.; American stmr. William Perkins, same, Krauss Brothers.

The American stmr. San Pedro is reported fixed with lumber and ties from Eureka to San Jose de Guatemala and La Union, Jan. loading, Hammond Lumber Co.

The following time charters are reported: Italian stmr. Euro, one or two round voyages, delivery and redelivery North of Hatteras, lumber, $1, Dec. Jan.; British stmr. Sheaf Mead, British Columbia to Japan, Jan., Canadian American Shipping Co.; Japanese stmr. Koshin Maru, 6 months' continuation Pacific trade, Yen 1.90, Ocean Transport Co.; Danish m.s. Nordbo, San Francisco and Grays Harbor to Australia, $1.40, American Trading Co.

The American schooner Meteor is reported sold from Henry G. Seaborn to Marine Products Corporation, Tacoma.

PAGE BROTHERS, Brokers.

Federal Appoints New Agents

W. D. Squires

W. D. (Bill) Squires and R. I. (Ray) Jones have been long and favorably known on the San Francisco waterfront as salesmen for and agents of various marine engineering specialties and ship supplies. On a recent visit to the Atlantic Coast, Bill Squires secured the San Francisco agency for the full line of the Federal Composition and Paint Company, Inc., of New York. This connection insures to the many marine users of Federal paints the active cooperation and advice of two well-known marine specialty experts whose experience with Pacific Coast practice and problems gives them a very valuable fund of useful knowledge.

The Federal Composition and Paint Co. is a world-wide corporation, having representation in every important port. In Great Britain the firm is known as the British Anti-Fouling Composition and Paint Co., with headquarters in London.

Federal factories are located in America at Brooklyn, N.Y., and in Great Britain at London and Dunkirk. In these factories paints especially adapted for every use aboard ship are manufactured under processes and inspection which guarantee uniform quality and long life. The line of liquid paints includes anti-fouling compositions for ships' bottoms and for boottop protection.

For wooden vessels there are special brands of copper paint in various shades and colors and of a quality that has gained fame for its manufacturers and provided great satisfaction to many boat owners.

For steel vessels, the Federal bottom compositions and anti-corrosive, anti-fouling, boot-top compositions are giving protection to an increasingly larger fleet each year.

A recent tabulation shows that during the year 1926 Federal paints were used on 2122 vessels, with a total gross tonnage of 7,793,793. This tremendous fleet, proving to the satisfaction of the shipowner the merits of Federal products, is a great floating advertisement for Federal service and Federal quality.

R. I. Jones

American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Shipbuilding Work in Prospect

SEATTLE FIRM LOW BIDDER FOR FIREBOAT

Bids were opened by the Board of Public Works of Seattle on January 14 for the construction and equipment of a triple screw, steel fireboat for the City of Seattle, and contract was awarded to the Pacific Coast Engineering Company.

Bids were submitted as follows:

Pacific Coast Engineering Company, $199,613.

Wallace Bridge & Structural Steel Co., Seattle, $247,694;

Lake Washington Shipyards, Seattle, submitted bids ranging from $256,433 to $268,269 according to the type of engines and machinery installed;

Albina Marine Iron Works, Portland, $244,000.

The fireboat was designed by W. C. Nickum of Seattle and is to be powered with gasoline engines driving triple screws.

The boat will be 128 feet long, 26 feet molded beam, and 11 feet molded depth.

The Pacific Coast Engineering Company has a plant at Seattle and at Oakland, California, and it is reported that the boat will be built at the Oakland yard. H. G. Plummer is president of the company, S. G. Plummer, vice-president and general manager, and J. J. Coney, secretary-treasurer.

NELSON LINE PLANNING IMPROVEMENTS

The Nelson Steamship Company, San Francisco, operating in the coastwise freight trade, recently purchased seven freighters from the Shipping Board, the Castletown, Plow City, Fort Armstrong, Tashmoo, Suwied, Marsodak, and Chetopa. According to A. J. Houda, freight traffic manager of the company at San Francisco, plans for equipping the seven carriers with passenger accommodations are being considered and will take definite form in a few months' time.

TO REBUILD YACHT

Henry J. Gielow, naval architect of New York, has been retained by Mrs. Hugh Dillman to draw up plans for the rebuilding of the yacht Delphine which was burned and sank in the Hudson river several months ago, but which has subsequently been raised by the Merritt, Chapman & Scott Corporation.

EXTENSIVE IMPROVEMENTS ON THE LEVIATHAN

According to Brigadier General A. C. Dalton, president of the Emergency Fleet Corporation, the steamship Leviathan will be altered and overhauled with a view of making larger accommodations for the second and tourist classes and improvements in the first cabin. The vessel is now undergoing her annual overhaul at her Hoboken pier and will be taken to Boston for dry-docking. Repairs and overhaul will cost in the neighborhood of $200,000.

The House of Representatives Naval Committee on January 12 reported a bill to authorize an appropriation of $13,150,000 for modernization of the battleships Oklahoma and Nevada, including elevation of firing range angle of the guns of the vessels.

IMPROVEMENTS FOR NAVY YARDS ON PACIFIC

Hearings were opened January 11 before the House Naval Affairs Committee on House Bill which would provide for extensive construction at navy yards, stations, and bases. Important work on the Pacific Coast and Hawaii are included in this bill which will greatly improve naval facilities and provide extensive work and necessitate the addition of much equipment.

Among the most important provisions for construction are:

Navy Yard, Bremerton, Washington: Accessories and crane, pier No. 6, $1,310,000; machine and electric shop, $1,000,000; equipment house, $100,000; paint and oil storehouse, $125,000. In addition to this there is an appropriation for $1,066,000 for the establishment of a naval air station at Sand Point, Washington.

Naval training station, San Diego, California: One small floating drydock, $350,000. In addition there is provision for a naval air station to cost $425,000.

PORTLAND FIREBOAT PLANS

Plans have not yet been completed for the three fireboats for the City of Portland, Oregon, for which a bond issue of $300,000 has been authorized by the citizens of the city. Work of drawing up the plans is under the supervision of the Chief of the Fire Bureau.

MACHINERY BIDS CALLED FOR COAST GUARD CUTTERS

Bids for the turbo-electric machinery for the Coast Guard Cutters Nos. 45, 46, and 47, will be opened at the office of the Coast Guard, Treasury Department, Washington, D.C., January 25. Bids for the construction of hulls will be called at a later date.

MARE ISLAND NAVY YARD TO BID ON SCOUT CRUISERS

Plans for three more of the light cruisers authorized by an appropriation act of May 21, 1926, have been completed and mailed to the yards for the preparation of bids for their construction. Mare Island Navy Yard is now preparing estimates.

BIDS OPENED FOR FERRYBOAT

The Quartermaster's Department of the Army at Governor's Island, New York, opened bids in December for a steel ferryboat. Bids were submitted

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by the Southern Shipyard Corporation, the American Brown Boveri Electric Corporation, Federal Shipbuilding & Drydock Company, and the Chas. Ward Engineering Works. A number of proposals were submitted by each company covering different types of machinery, including steam engine and Scotch boiler power, steam-electric, direct diesel, and diesel-electric. Prices ranged from $223,000 to $395,000. Some time will probably be required to analyze the bids and decide on the type of propulsion power to be employed.

ATLANTIC COASTWISE PASSENGER VESSELS PLANNED

The Colonial Navigation Company, Pier 39, North River, New York, is planning the construction of two passenger steamers for coastwise trade between New York and Providence. Plans and specifications will be ready in January. Theo. E. Ferris, New York, is naval architect.

RUMORS OF OIL TANKER CONSTRUCTION

The shortage of oil tank steamers has brought forth many rumors of prospective new construction. One of these rumors is to the effect that the Gulf Refining Company of New York is considering the construction of a second tanker on the same plans as the one now building at the Federal Shipbuilding & Drydock Company. The Cities Service Corporation, New York, is also reported to be on the eve of an award of contract for the construction of a 13,000-ton tanker to a New York yard.

It is reported that plans and specifications have been completed by the Standard Oil Company of Indiana for the construction of one or two 360-foot tankers for Great Lakes Service.

The U. S. army transport Grant is to be converted into an oil burner. The bids have not yet been asked for the work; but it is estimated that the total work on the vessel will cost in the neighborhood of $200,000.

The Navy Department has turned out plans for a new design of 26-foot motor boats. Mare Island Navy Yard expects to build eight of the new type of boats this spring.

The U. S. Shipping Board has passed a resolution authorizing Commissioner Benson to purchase six additional auxiliary internal combustion engines for use in the diesel conversion program, the cost not to exceed $16,500 each.

News from the Shipyards

FERRYBOAT FRESNO LAUNCHED

The Fresno, first of the three new all steel diesel-electric vehicular ferryboats now being constructed for Southern Pacific company for service on San Francisco Bay, was launched at the yards of the Bethlehem Shipbuilding Corporation, San Francisco, on January 15. Miss Shirley Harding, daughter of C. R. Harding, engineer of standards for Southern Pacific Company, officiated at the launching as sponsor for the new boat.

Representatives of the city and county governments of Fresno, the Fresno Chamber of Commerce, Fresno Traffic Association, and civic and fraternal organizations made up a special excursion for the launching ceremony.

The Fresno is 256 feet long, 66 feet beam, and has a capacity of 95 to 100 automobiles. Four Nelseco engines of 450 horsepower each will be connected to General Electric generators. The boat is of all steel construction and will cost, completed, about $525,000.

CONVERTED VESSEL UNDERGOES TRIALS

The motorship Ethel M. Sterling, formerly the barkentine Hawaii, is now in service following the installation of two 240-horsepower Fairbanks-Morse diesel engines. The vessel made an average speed of 8.24 knots on her trials on Lake Washington. L. H. Coolidge, Seattle naval architect, was in charge of the conversion for her owners, the Sterling Steamship Company of Seattle. The Hawaii is 206 feet 3 inches long, 42 feet beam, and 17 feet 9 inches depth. She will make her first trip as a motorship with a full cargo of lumber for South America.

FISHING INTERESTS OF SEATTLE IN MERGER

Consolidation of fisheries and fishing plants to be known as the Wakefield Fisheries and representing approximately $1,000,000 was recently consummated in Seattle. Lee H. Wakefield is president with headquarters in the L. C. Smith Building. The firms included in the merger are: The Baranof Packing Co., with a plant at Red Bluff Bay, Alaska, and the Franklin Packing Co., whose main plant is in the Prince William Sound district on Saw Mill Bay.

LAUNCH SCHOONER YACHT

A schooner built especially for cruises into the ice strewn waters of the Arctic was launched on January 19 at the yard of W. F. Stone & Son, Alameda, California. The owner is John Borden of Chicago, well known sportsman who lost one ship in the Bering sea while on a former expedition.

The yacht was christened the Northern Light by Mrs. Borden. May 1 is set for the day of sailing to the Arctic on an excursion for hunting polar bear and walrus and for the study of plant and animal life in the cold regions of the north.

The Northern Light is especially built for the heavy work she will have to perform. She is 140 feet between perpendiculars, 30 feet beam, and 14 feet loaded draft. She will have a main mast 142 feet high and the lower sails alone will total 7500 square feet of canvas. Two auxiliary diesel engines totaling 360 horsepower will be installed and she will have a cruising radius of 4000 miles. Henry C. Grebbe of Chicago is the designer.

AUTO FERRYBOAT LAUNCHED

With whistles blowing and with the usual ceremony that attends a launching, the new ferryboat Defiance slid down the ways from the Washington Navigation Company shipyards at Gig Harbor, Washington, on Sunday, January 16.

The launching was witnessed by over

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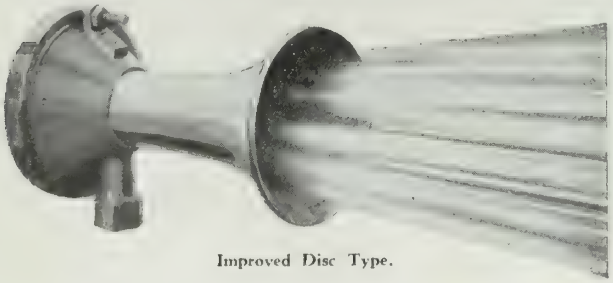

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The McCaffrey Co. ....San Diego

500 interested spectators from Tacoma and Gig Harbor and the vessel was christened by Miss Vernetta Jean Rowland, daughter of Mr. and Mrs. I. C. Rowland of Tacoma, and Miss Amanda Skansie, daughter of Mr. and Mrs. Mitchell Skansie of Gig Harbor. Following the launching the ferry was towed back to the dock and visitors were allowed to inspect it.

The vessel is 165 feet long and will carry 80 automobiles. It is a double ender with propellers at both ends. It will be powered with a 360 horsepower diesel engine and will be ready for its trial trip March 15. The Defiance cost $95,000, has a beam of 51 feet and a depth of 14½ feet.

Immediately following the launching, the keel of a thirty car ferry was laid. This boat will be named Narrows and will be launched March 15.

MOTORSHIP GULFPRIDE LAUNCHED

The new motorship Gulfpride, a 17,400 DWT, twin-screw bulk oil tanker, building for the Gulf Refining Company, was launched on January 20 at the yard of the Federal Shipbuilding and Dry Dock Company, Kearny, New Jersey. Mrs. J. E. Nelson, wife of the Treasurer of the Gulf Refining Company, acted as sponsor.

The Gulfpride is especially interesting on account of being the first vessel built in this country on the new Isherwood bracketless system of hull construction, and is also the largest so far constructed on this system in the world.

The vessel is 544 feet long over-all, with a beam of 74 feet and a molded depth of 40 feet 6 inches. There are 10 main cargo and 10 summer tanks with a total capacity for over 6,000,000 gallons of oil or gasoline. The deadweight capacity is 17,400 tons on a 28 foot draft.

The propelling machinery consists of two Bethlehem 4-cylinder, 2-cycle, single-acting diesel engines of 2000 shaft horsepower each, which will give the vessel a speed of 11 knots. All auxiliary machinery, including the cargo oil pumps, will be electrically driven and special mechanical ventilation is provided in the pump room as protection for gasoline cargo. The vessel will be completely equipped, including such modern appliances as Gyro compass, radio compass, automatic steerer, and Lux system of fire protection, and is expected to be ready for sea about April 1.

The Ericksen Boat Builders, Ltd., has been incorporated under the laws of British Columbia, with an authorized capital of $50,000 to do business as shipowners, ship broker, shipping agent, freight contractor, etc., in addition to their original business operating a shipyard.

John F. Metten, chief engineer of the William Cramp & Sons Ship & Engine Building Company, Philadelphia, was elected a vice-president of the company at a meeting of the board of directors last December.

The shipbuilding plant of the Pusey & Jones Company, Wilmington, Delaware, has been sold at auction to Clement C. Smith for $2,000,000. Work at the yard has been temporarily held up.

We regret to report the death on January 8 of Fred L. Baker, head of the Los Angeles Shipbuilding & Drydock Corporation and of the Baker Iron Works of Los Angeles. Mr. Baker was one of the founders of the Los Angeles Steamship Company and Los Angeles Shipbuilding & Drydock Company and was a very active and progressive member of a number of leading Los Angeles industries and development organizations.

The Canadian Pacific Railway Company has placed an order with John Brown & Co., Glasgow, Scotland, for a British Columbia coastwise passenger steamer. The vessel will be 290 feet long and will have accommodations for 2000 passengers and 50 automobiles. She will be of the same type as the Princess Adelaide now in operation and will cost about $500,000

The Ballard Marine Railway Company, Seattle, recently launched for the account of Fairbanks-Morse & Co. a new standard model troller for demonstration purposes. The boat is called the Sultan. The engine builders will demonstrate in this troller model full diesel engines of 10, 20, 30, and 40 horsepower, the first installation being a 40-horsepower engine. Guy E. Craig is marine superintendent at Seattle for the Fairbanks, Morse & Co. The vessel was designed by L. H. Coolidge of Seattle.

Contract for a large floating drydock for Singapore has been let to Swan, Hunter & Richard, Ltd., Wallsend-on-Tyne, to cost in the neighborhood of $6,000,000.

The Portland Marine Iron Works opened at Portland early in January under the ownership of George W. Penketh, who bought the plant and business from Thomas N. Monks. Mr. Penketh was formerly vice-president and general manager of the Albina Marine Iron Works.

The Milton Shipbuilding Corporation, Rye, N. Y., have been chartered at Albany to engage in the business of shipbuilders and navigators, contractors, engineers, etc. J. H. Halstead, Thomas D. Scott, Rye, N. Y., and F. D. Sayler, 25 West 43rd St., New York, are directors and J. T. Aspbury, John R. Turner, and F. H. Butehorn, 120 Broadway, New York, are subscribers.

At a recent election the Atlantic Coast Shipbuilders Association, S. W. Wakeman, vice-president and general manager of the Bethlehem Shipbuilding Corp., Ltd., was elected to membership on the Administrative Council. Mr. Wakeman is selected as representative of the New England Section and will direct work of enlisting the support of marine interests in New England.

The Pacific Marine Supply Company of Seattle have been appointed exclusive distributors in the Pacific Northwest for the entire marine line of equipment manufactured by Chas. Cory & Sons, Inc. A stock will be carried in Seattle; the Portland branch of the company, the Oregon Marine & Fisheries Supply Company, will look after the Columbia River territory.

In Pacific Coast *Shipyards*

Ship Repairing — Ship Building — Reconditioning — Engine Repairing

Recent Shipbuilding Contracts

Winslow Marine Railway & Shipbuilding Co., Seattle, has been awarded a contract for an automobile and passenger ferryboat for the Sound Ferry Lines, Inc., Capt. O. Joyce, Edmonds, Wn., vice-president and general manager. The boat is to be 160 feet over-all, is to have capacity of 60 automobiles and 500 passengers and is to be propelled by two 375-horsepower, 6-cylinder Washington-Estep diesel engines. Lee & Brinton, naval architects of Seattle, designed the boat.

This yard is also building ten barges for Captain Harry Crosby of Seattle at a cost of $10,000 each.

Robins Dry Dock & Repair Co., Brooklyn, N.Y., has an important job from the Standard Transportation Company of New York. This is the conversion of the freighters Eagle and Tiger, both 6274 gross tons, to tank vessels. There will probably also be some change in the propulsion equipment.

J. C. Johnson, Port Blakely, Wash., has an order from the Sunny Point Packing Company of Seattle for a 75-foot combination towboat and cannery tender.

N. M. McLean Shipyards, Prince Rupert, British Columbia, has an order from John Wick for a halibut schooner 48 ft. long by 12 ft. beam. This yard is also building two 42-foot seine boats for the Gosse Packing Company Ltd., to be equipped with Standard gas engines.

Great Lakes Engineering Works, River Rouge, Michigan, has an order for a bulk cement freighter from the Huron Transportation Company, to be called the S. T. Crapo. The freighter will be 385 ft. between perpendiculars, 60 ft. beam, and 19 ft. loaded draft. The propelling unit will consist of triple expansion engines of 1800 horsepower, steam being supplied by three Scotch boilers of 12 ft. 9 in. diameter. The boat will have a speed of 11 miles an hour and a deadweight tonnage of 7200. Keel will be laid next April.

American Bridge Company, Pittsburgh, has an order for 30 coal barges from the Carnegie Steel Company. These are in addition to 15 coal barges previously ordered. The barges will be 175 ft. long, 26 ft. beam, and 11 ft. depth.

Dravo Contracting Company, Pittsburgh, recently received an order from the Pittsburgh Plate Glass Company for two dump scows, 110 ft. by 26 ft. by 8 ft. 6 in. of 220 gross tons capacity each; also one steel hull A frame derrick boat. This company has also received an order from the Ohio River Gravel Company, for a 2 cu. ft. steam dredge, 120 by 32 by 6 ft.

Midland Shipbuilding Company, Ltd., Midland, Ontario, was recently awarded a contract by the Canada Steamship Lines, Ltd., for two package freighters. The vessels will be 250 ft. between perpendiculars, 42 ft. 9 in. beam, and 26 ft. 6 in. draft. Keel was laid on January 19 and delivery is to be this spring.

J. C. Johnson's Shipyard. Port Blakely, Wn., has three new orders. One is for a pile driver scow for the Kadiak Fisheries Co., Seattle; the second is for a cannery tender for the Sunny Point Packing Co., Seattle; and the third is a fish scow for Captain Steve Selig of Ketchikan, Alaska.

KEEL LAYINGS

Oil tow barge for Julian Petroleum Corp., Los Angeles, by Los Angeles Shipbuilding & Drydock Corp., Dec. 27.

Four barges for U. S. Engineers, St. Louis, by American Bridge Co., during Dec.

Six motor patrol boats for U. S. Coast Guard by American Brown Boveri Electric Corp., during Dec.

Bulk freighter for Pittsburgh Steamship Co., Cleveland, by Great Lakes Engineering Works, Jan. 3.

Motor tank barge for Gulf Refining Co., by Sun Shipbuilding Co., Dec. 3; twin screw motor tank barge for Tidewater Oil Co., Jan. 3.

Steel barge for W. C. Kelly Barge line by The Chas. Ward Engineering Works, Jan. 3.

Steel guide dock for E. T. Slider, New Albany, Ind., by Howard Shipyards & Dock Co., Nov. 26.

LAUNCHINGS

Fresno, diesel-electric ferryboat for

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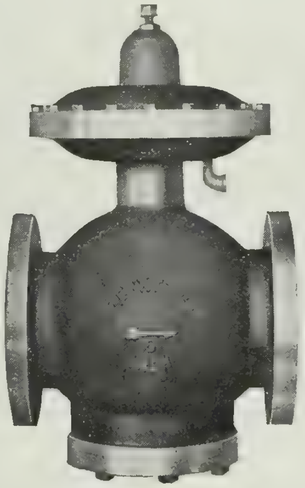

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In Atlantic Coast *Shipyards*

Ship Repairing ~ Ship Building ~ Reconditioning ~ Engine Repairing

Southern Pacific Co. by Bethlehem Shipbuilding Corp., San Francisco, Jan 15.

Northern Light, schooner yacht for John Borden, Chicago, by W. F. Stone & Son, Oakland, Calif., Jan. 19.

Steel discharge pontoons for U. S. Army Engineers by Marietta Mfg. Co., during Dec.

Oil barge for Southern Cotton Oil Co., by Midland Barge Co., Midland, Pa., Dec. 1; 3 barges for Inlant Waterways Corp., during Dec.

Deck barge for stock by Nashville Bridge Co., Dec. 21.

Iroquois, passenger and freight steamship for Clyde Steamship Co., by Newport News Shipbuilding & Drydock Co., Dec. 11.

Hydraulic Dredge for American Dredging Co. by Sun Shipbuilding Co., Jan. 4.

DELIVERIES

Barge for Reading Co. by American Brown Boveri Electric Corp., in Dec.

Patricia Barrett, steam towboat for Barrett Line by Howard Shipyards & Dock Co., Dec. 14; concrete mixer hull for Mississippi River Comm., Jan. 1; steel automobile ferryboat for D. T. Williams, Richmond, Ky., Dec. 15.

Car ferryboat for Grand Trunk Milwaukee Car Ferry Co., by Manitowoc Shipbuilding Corp., Dec. 9.

Algonquin, passenger and freight steamship for Clyde Steamship Co., New York, by Newport News Shipbuilding & Drydock Co., Dec. 8.

No. 33 and No. 34, tugboats, for New York Central Railroad by Staten Island Shipbuilding Co., Dec. 14 and Jan. 6.

Stern wheel towboat for International Petroleum Co., by Sun Shipbuilding Co., Dec. 11; oil barge for Proctor & Gamble, Dec. 22.

Steel barge for W. C. Kelly Barge Line by Chas. Ward Engineering Works, Nov. 29.

REPAIR AWARDS

The largest repair job of the month was awarded to **The Moore Dry Dock Company,** Oakland, on a bid of $145,872 and 64 days. This job consists of damage repairs to the Eagle Oil Company tanker San Ubaldo, which went ashore near Newport Beach late in December. The vessel, when docked for inspection at San Pedro, showed that 73 forward plates of her bottom were buckled and will have to be replaced. The vessel was given temporary repairs to permit towing to San Francisco.

Others who submitted bids for this work were: Bethlehem Shipbuilding Corp., $147,680; Hanlon Drydock & Shipbuilding Co., $150,274; Todd Dry Docks, Inc., $153,000; Wallace Dry Dock Company, Vancouver, $155,000. The bids were opened by Captain A. C. Williams of New Orleans, representing the owners, and Captain Wm. Logan of Vancouver, representing the underwriters.

The Moore Dry Dock Company was low bidder for conditioning the steamer Guide, U. S. Coast and Geodetic Survey, to cost about $5000.

The Commercial Iron Works, Portland, Oregon, was successful bidder for overhauling the Coast Guard cutter Algonquin. The vessel is at dock at the St. Johns drydock. Work will consist of cleaning and painting the hull, also considerable wood work, as well as electrical jobs and general repairs. The Commercial Iron Works submitted a bid of $12,689.45 and 45 days.

Progress of Construction

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT

Potrero Works, San Francisco

Purchasing Agent: O. W. Streett.

Fresno, hull 5331, double-end diesel-electric vehicular ferryboat for Southern Pacific Co., San Francisco; 256′ L.O.A.; 44′10″ beam; 19′ depth; four Nelseco diesel engines, 450 H.P. each; keel Nov. 8/26; **launched Jan. 15/27.**

Stockton, hull 5332, sister to above; keel Nov. [illegible] 26.

Tahoe, hull 5333, sister to above; keel Feb. 1/27 est.

GENERAL ENGINEERING & DRYDOCK CO., Alameda, California

Purchasing Agent: Geo. Armes.

Golden Bear, hull 3, diesel-electric wooden auto ferry for Golden Gate Ferry Co.; 240′ L.B.P.; 44′ beam; 11′ 6″ loaded draft; 13 knots speed; 3-400 B.H.P. Ingersoll-Rand diesel engines, direct connected to Westinghouse generators; keel Oct. 28/26; launch Feb. 2/'27 est.

Not named, hull 4, sister to above.

Not named, hull 5, sister to above.

Not named, hull 6, diesel-electric, steel automobile ferryboat for Southern Pacific Co.; 236′ L.B.P.; 44′ 10″ beam; 12′ 6″ loaded draft; 13 knots speed; 4-450 B.H.P. Nelseco diesel engs. connected to General Electric generators; keel Oct. 28/26.

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C. M. LANE LIFE BOAT CO.
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R. H. LAVERIE & SONS, Inc.
Material Testing and Inspection.

PRESCOTT IRON WORKS
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Berth 94 San Pedro, Calif.

J. C. JOHNSON'S SHIPYARD
Port Blakely, Wn.

Kadiak No. 2, hull 94, pile driver scow for Kadiak Fisheries Co., Seattle; 65 by 24 ft.

Hull 95, cannery tender for Sunny Point Packing Co., Seattle; 75 by 17 ft.

Selig No. 1, hull 96, fish scow for Capt. Steve Selig, Ketchikan, Alaska; 60 by 18 by 4ft.

LAKE WASHINGTON SHIPYARDS.
Houghton, Wash.

Purchasing Agent: A. R. Van Sant.

Cruiser for Stewart Edward White, 58 feet L.B.P.; 55 H.P. Washington-Estep diesel eng.; keel Oct. 11/26.

Five scows, 60 ft. long; keels Oct. 11/26.

LOS ANGELES SHIPBUILDING & DRY DOCK CORPORATION
San Pedro, Calif.

Not named, hull 53, oil barge for Julian Petroleum Corp., Los Angeles; 131 L.B.P.; 40 beam; 9-6 loaded draft; 1050 D.W.T.; **keel Dec. 27/26.**

THE MOORE DRY DOCK COMPANY
Oakland, California.

Purchasing Agent, Nat Levy.

Peralta, hull 170, double-ended, screw propelled ferryboat for Key System Transit Co.; 256 L.B.P.; 47 molded beam; 21 molded depth; 14.5 normal speed; turbo-electric propulsion; water-tube boilers; keel May 3/26; launched Oct. 14/26; deliver Jan. 30/27 est.

Yerba Buena, hull 171, sister to above; keel May 3/26; launched Nov. 22/26; deliver Feb. 15/27 est.

Not named, hull 172, diesel-electric, steel, vehicular ferryboat for Southern Pacific Company; 236′ L.B.P.; 44′10″ beam 12′6″ loaded draft; 13 knots speed; 1250 S.H.P. Nelseco diesel engs.; connected to Westinghouse generators; keel Dec. 8/26; launch Mar. 15/27 est.

Not named, hull 173, sister to above; keel Dec. 8/26; launch Apr. 2/27 est.

PRINCE RUPERT DRYDOCK AND SHIPYARDS
Prince Rupert, B.C.

One 75-foot tugboat for Granby Consolidated Mining, Smelting & Power Co.

W. F. STONE & SON
Oakland, Calif.

Purchasing Agent: Lester Stone.

No name, motor cruiser, for stock, 36x10x3½ ft.; 12 mi. speed: 65-HP. gas engines.

Northern Light, hull 824, yacht for John Borden; 140 L.B.P.; 30 beam; 14 loaded draft; 10 mi. speed; 360 I.H.P. diesel engs.; keel Sept. 1/26 est.; **launched Jan. 19/27**; deliver May 1/27 est.

Not named, hull 828, yacht for Frank B. Drake; 55 L.B.P.; 13 beam; 6 loaded draft; 7 mi. speed; 30 I.H.P. gas eng.; keel Aug. 25/26 deliver May 1/27 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Two towboat hulls for Carnegie Steel Corp., Pittsburgh; 149′ 2″ x 33′ 4″ x 5′ 10-5/16″: deliver Jan./27 est.

Six barges for U. S. Engineers, St. Louis, 152x34x7 ft.; **4 keels laid Dec. /26.**

Five barges for Wheeling Steel Corp., 140x26x10 ft.

Fifteen barges for Carnegie Steel Co., 175x26x11 ft.

One towboat hull for Hillman Trans. Co.; 149′ 2″x33′4″x5′ 1 15-16″; keel Nov. 20/26; launch Jan. 5/27 est.

One derrick boat hull for T. Smith & Son, Inc., New Orleans; 110′x50′x10′.

30 coal barges for Carnegie Steel Co.; 175x26x11 ft.

AMERICAN BROWN-BOVERI ELECTRIC CORP.
Camden, N. J.

Purchasing Agent: L. G. Buckwalter.

Hull 320, steel motor patrol boat for U. S. Coast Guard, Washington, D.C.; 125 L.O.A.; 23′6″ molded beam; 220 tons displacement; Winton diesel engs.; keel July/26; launched Nov./26

Hull 321, same as above, keel July/26; launched Nov./26.

Hull 322, same as above; keel July/26; launched Nov./26.

Hull 323, same as above, keel July/26, launched Nov./26.

Hull 324, same as above, keel July/26; launched Nov./26

Hull 325, same as above; keel Sept./26.

Hull 326, same as above; keel Sept./26.

Hull 327, same as above; keel Sept./26.

Hull 328, same as above; keel Sept./26.

Hull 329, same as above, keel Sept./26.

Hull 330, same as above; keel Sept./26.

Hull 331, same as above; keel Sept./26.

Hull 332, same as above, keel Nov./26

Hull 333, same as above, keel Nov./26

Hull 334, same as above; keel Nov./26.

Hull 335, same as above; keel Nov./26

Hull 336, same as above; keel Nov./26.

Hull 337, same as above; keel Nov./26

Hull 338, same as above; **keel Dec./26.**

Hull 339, same as above; **keel Dec./26.**

Hull 340, same as above; **keel Dec./26.**

Hull 341, same as above; **keel Dec./26.**

Hull 342, same as above; **keel Dec./26.**

Hull 343, same as above; **keel Dec./26.**

Hull 344, same as above.

Hull 345, same as above.

Hull 346, same as above.

Hull 347, same as above.

Hull 348, same as above.

Hull 349, same as above.

Hull 350, same as above.

Hull 351, same as above.

Not named, hull 355, diesel-electric vehicular ferryboat for Electric Ferries, Inc., New York; 155 L.O.A.; 48′6″ beam; 14′4″ depth; keel June/26.

Hull 356, same as above, keel June/26.

Hull 357, same as above; keel June/26.

Hull 358, barge for Reading Co., 110x32x9.5 ft.; keel Oct./26; **delivered Dec./26.**

Hull 359, same as above; keel Oct./26; **delivered Dec./26.**

Hull 360, same as above; keel fall /26 est.

Hull 361, same as above; keel fall /26 est.

Hull 364, carfloat for Reading Co.; capacity 10 cars; keel winter /27 est.

Hull 365, carfloat for Reading Co., capacity 10 cars; keel winter /27 est.

Hull 366, carfloat for Reading Co., capacity 8 cars; keel winter /27 est.

Hull 367, carfloat for Reading Co., capacity 8 cars; keel winter /27 est.

Hull 368, carfloat for Reading Co., capacity 8 cars; keel winter /27 est.

Hull 369, carfloat for Reading Co., capacity 8 cars; keel winter /27 est.

THE AMERICAN SHIP BUILDING COMPANY
Cleveland, Ohio.

Purchasing Agent: C. H. Hirsching.

Wm. McLauchlan, hull 793, bulk freighter for Pickands, Mather & Co.; 580 L.B.P.; 60 beam; 20 loaded draft; 13 mi. loaded speed; 12,000 D.W.T.; T.E. engs.; 2400 I.H.P.; 3 B. & W. boilers 200 lbs. pressure; keel July 19/26; launched Oct. 7/26; deliver Nov. 25/26 est.

Robert Hobon, hull 794, sister to above keel Aug. 9/26; launched Oct. 30/26; deliver Dec. 20/26 est.

No name, hull 795, bulk freighter for Inland Steel Co.; 596 L.B.P.; 64 beam; 20 loaded draft; 13 mi. speed; 13,500 D.W.T.; T.E. engs.; 2700 I.H.P.; 3 Scotch boilers, 24′6″x11′x185 lbs.; keel Nov. 8/26 est. launch Jan. 22/27 est.; deliver Mar. 11/27 est.

No name, hull 796, bulk freight steamer for Kinsman Transit; 580 feet L.B.P.; 60 feet beam; 20 loaded draft; 13 mi. speed; 12,000 D.W.T.; triple expansion engs.; 2500 I.H.P.; 3 Scotch boilers, 14x11; 159 lbs. pressure; keel Oct. 18/26; launch Dec. 30/26 est.; deliver Feb. 16/27 est.

No name, hull 797, self-unloading bulk freighter for Bradley Transportation Co.; 615 L.B.P.; 65 beam; 20 loaded draft; 14 mi. speed; 13,000 D.W.T.; turbo-electric drive; 4000 I.H.P.; 2 water tube boilers; 325 lbs. pressure; keel Jan. 10/27 est.; launch Mar. 27/27 est.;; deliver July 1/27 est.

Harry Coulby, hull 798, bulk freighter for Pickands, Mather & Co.; 607′ L.B.P.; 65′ beam; 33′ loaded draft; 13 mi. speed; 13,800 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 B. & W. boilers; 200 lbs. pressure; keel Jan. 1/27 est.; launch Apr. 17/27 est.; deliver July 1/27 est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT
Quincy, Mass.

Lexington, hull 1300, airplane-carrier U.S.N., launched Oct. 3/25.

Governor Carr, hull 1401, ferryboat for Jamestown-Newport Ferry Co.; 150′x48′x14′; 703 gro. tons; keel Oct. 11/26.

Hull 1402, carfloat, N.Y., N.H. & Hartford R.R.; 360′x40′x11′6″; 1375 gro. tons; keel July 14/26.

Hull 1403, carfloat, same as above; keel July 15/26.

Hull 1404, carfloat, same as above; keel July 16/26.

Hull 1405, carfloat, same as above; keel July 16/26.

Hull 1406, oil barge for City Service Transport Co. 204′x35′6′x14′3″.

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT
Wilmington, Del.

Not named, hull 3511, oil barge for Seaboard Shipping Corp.; 170′x37′x12′6″; keel Oct. 12/26; launch Dec. 22/26 est.; deliver Dec. 29/26 est.

BETHLEHEM SHIPBUILDING CORP., BALTIMORE DRY DOCK
Baltimore, Md.

Hull 6136, carfloat for Western Maryland R.R.; 190′x35′x9′; keel Aug. 12/26.

CHARLESTON DRY DOCK AND MACHINERY COMPANY
Charleston, S. C.

Purchasing Agent: Charles R. Valk

Towboat, owner not named; 64 ft. long; keel Nov. 17/26.

Dredge for Gulf Refining Co.; 95′x30′x8′; keel Oct. 11/26.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.
Philadelphia, Pa.

Purchasing Agent: Ed. C. Geehr.

Malolo, hull 509, express psgr and frt liner, Matson Navigation Co.; 582 LOA; 577 length at water line; 83 ft beam; depth molded to C deck 54 ft.; displacement 22,050 tons; 8250 DWT; speed 22 knots regular, 23 knots maximum; 25,000 shaft horsepower; Cramp-Parsons turbines; oil burning B & W water-tube boilers; keel May 4/25; launched June 26/26; deliver May 1/27 est.

Yarmouth, hull 518, twin screw passenger and freight steamer for Eastern Steamship Lines; 378 length at water line; 55-6 beam; 29-6 molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears, six single-ended Scotch boilers; keel Feb. 23/26; launched Nov. 6/26; deliver Apr. 1/27 est.

Evangeline, hull 524, twin screw passenger and freight steamer for Eastern Steamship Lines; 378 length at water line; 55′6″ beam; 29′6″ molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears; 6 single-ended Scotch boilers; keel May 1/26; launch Mar. 1/27 est.; deliver May 1/27 est.

Salt Lake City, hull 531, light cruiser for United States Navy; 10,000 tons displacement; keel Apr./′7 est.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

Purchasing Agent: G. O. Williams.

Comoco, hull 122, steel yacht for R. W. Judson, Detroit; 140′ L.B.P.; 23′6″ beam; 8′9″ loaded draft; 15 mi. speed; 260 D.W.T.; 600 I.H.P. diesel engs; keel Dec. 15/26; launch May 1/27 est.; deliver June 1/27 est.

Not named, hull 121, steel yacht, owner not named; 105 L.B.P.; 17′ beam; 6′ loaded draft; 13 mi. speed; 110 D.W.T.; 200 I.H.P. diesel engs.; keel Nov. 1/26; launch Apr. 15/27 est.

DRAVO CONTRACTING COMPANY
Pittsburgh, Pa.

Hulls 497-502 inc., 6 steel barges for stock; 230x45x11 ft.; 650. gro tons ea.

Hull 531, 1 diesel engine towboat, Wheeling Steel Corp., Wheeling, W. Va.; 110′x26′x5′; 215 gro. tons.

Hull 534, 1 ladder type sand and gravel dredge for Pittsburgh Plate Glass Co.; 155x44x8ft., 430 gross tons.

Hulls 536-538 inc., three steel whirler boat hulls for Contracting Dept.; 40x48x5′6″; 100 gro. tons.

Hull 539, 1 diesel engined towboat for Labelle Transportation Co., 110′x26′x5′; 215 gro. tons.

Hulls 544-550 inc., 7 pile driver hulls for U.S. Engineers, St. Louis; 88′x25′x4′; 100 gro. tons ea.

Hulls 540-543 inc.; 4 steel barges for Keystone Sand & Supply Co.; 135′x27′x8′; 320 gro. tons ea.

Hull 553-566 inc., 14 steel barges for Mississippi River Commission, Memphis; 120′x30′x7′4″; 430 gro. tons ea

Hulls 569-572 inc., 4 steel hopper type barges for Pittsburgh Plate Glass Co., 135x26x10 ft. 320 gro. tons ea.

Hulls 577-578, 2 dump scows for Pittsburgh Plate Glass Co.; 110x26x8 ft. 6in.; 220 gro. tons. ea.

Hull 579, steam dredge for Ohio River Gravel Co.; 120 x 32 x 6 ft.; 200 gro. tons.

Hull 580, steel hull "A" frame derrick boat for Pittsburgh Plate Glass Co.; 72 x 34 x 5 ft.; 120 gro. tons.

DUBUQUE BOAT & BOILER WORKS
Dubuque, Iowa

Purchasing Agent: A. L. Yehger.

Two steel dump scows for U.S. Engineers, Louisville, Ky.

Thorpe, river towboat for Upper Mississippi Barge Line Co. & Inland Waterways Corp.; 132′x35′x3′6″; stern wheel, tandem comp. surface condensing engs.; 15″x30″x78″ stroke; keel Oct. 1/26 est.; launch Mar. 1/27 est.; deliver Apr. 1/27 est.

Weber, river towboat, sister to above; keel Oct. 1/26 est.; launch Mar. 1/27 est.; deliver Apr. 1/27 est.

Morse, river towboat, sister to above; keel Oct. 1/26 est; launch Mar 1/27 est; deliver Apr. 1/27 est

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent: R. S. Page.

Gulfpride, hull 86, tanker for Gulf Refining Co.; 525′ L.B.P.; 74′ beam; 28′ loaded draft; 11 knots speed; 17,400 D.W.T.; 4500 I H P diesel engs.; keel June 15/26; **launched Jan. 20/27.**

No name, hull 89, passenger and freight steamer for Southern Pacific Steamship Lines, Pier 49, North

(Continued on Page 104.)

Armies of Oxwelded Tanks

In every industry where the storage of liquids is an important problem, welded tanks are used because they are ultimately more economical. The longer life, greater resistance to strain, and complete elimination of both leakage and maintenance, have been responsible for their popularity.

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Prest-O-Lite
DISSOLVED ACETYLENE

River, New York; 427 L.B.P.; 60 beam, 25'6" loaded draft; 6700 D.W.T.; De Laval steam turbines; 7700 S.H.P.; 4 B. & W. boilers, 21,900 sq. ft heating surface; 16,000 sq. ft. superheating surface; keel Feb. 1/27 est.

GREAT LAKES ENGINEERING WORKS

River Rouge, Mich.

Purchasing Agent: Chas. Short.

Not named, hull 255, bulk freighter for Pittsburgh Steamship Co., Cleveland; 580 L.B.P.; 60 beam! 20 loaded draft; T.E. engs.; 2200 I.H.P.; 3 Scotch boilers 12' diam by 11'6"; **keel Jan. 3/27;** deliver May 30/27 est.

S. T. Crapo, hull 256, bulk cement freighter for Huron Transportation Co.; 385 L.B.P.: 60 beam; 19 loaded draft ;11 mi. speed; 7200 D.W.T.; T.E. engs.; 1800 I.H.P.; 3 Scotch boilers, 12 ft. 9 in. diam.; keel April 1/27 est.; launch Aug. 1/27 est.; deliver Oct. 1/27 est.

HOWARD SHIPYARDS & DOCK COMPANY

Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

No name, hull 1590, diesel-electric side-wheel excursion boat for stock; 250x40x7 ft.; 15 mi. speed; 2-400 H.P 6-cyl. diesel engs.

Patricia Barrett, hull 1592, steam towboat for Barrett Line, Cincinnati; 125' L.B.P.; 40' beam; 6' deep; 4' loaded draft: comp. engs. 18"x32"x6'; 4 Scotch boilers, 44"x22'; keel June 23/26; launched Sept. 21/26; **delivered Dec. 14/26.**

Hull 1593, steel hull for stmr. Mississippi of Mississippi River Com., St. Louis, Mo.; keel Sept. 25/26; launch and deliver Feb 1/27 est

Hull 1596, concrete mixer hull for Mississippi River Commission, St. Louis, Mo.; 120 L.B.P.; 45 beam: 7' depth, keel Oct 21/26; **launched Dec. 29/26: delivered Jan. 1/27.**

Hull 1597, steel guide dock for E. T. Slider, New Albany, Ind.; 120'x24'x4'; keel Nov. 16/26; launch Feb. 14/27 est.

Hull 1598, same as above; **keel Nov. 26/26;** launch Feb. 20/27 est.

Hull 1599, same as above.

Hull 1600, same as above.

Hull 1601, hull for Baton Rouge Car Terminal, Baton Rouge, La.; 285'x60'x9'6"; keel Jan 20/27 est.

Hull 1602, steel automobile ferryboat for D. T. Williams, Richmond, Ky.; 93'x20'x2'6"; keel Oct. 27/26; launched Nov. 30/26; **delivered Dec. 15/26.**

Not named, hull No. 1603, diesel ferryboat for Tri-State Ferry Co., Cairo, Ill.; 100 L.B.P.; 30' beam; 5' depth; 9 mi. loaded speed: 125 D.W.T.; 6-cyl. diesel eng.; 180 I.H.P.; keel Feb. 1/27 est.

MANITOWOC SHIPBUILDING CORPORATION

Manitowoc, Wis.

Purchasing Agent: H. Meyer.

Hull 226, one car ferry for Grand Trunk Milwaukee Car Ferry Co.; 360' L.O.A.; 58' molded beam; 21'6" depth; 2 T.E. engs.; 4 Scotch boilers; launched Oct. 23/26; **delivered Dec. 9/26.**

Hull 227, car ferry, sister to above; keel July 1/26; launch Jan. 19/27 est.; deliver Mar. 1/27 est.

MARIETTA MANUFACTURING COMPANY

Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Thirty steel discharge pontoons for U.S. Army Engineers, Rock Island, Ill.; 38'x14'x3'2"; **3 launched.**

One steel stern-wheel towboat for Magdalena River, Colombia; 125'x26'x5'; tandem compound engs.

Twelve steel hoppered cargo barges for Magdalena River, Colombia; 125'x26'x6'; keel Dec. 17/26 est.

MIDLAND BARGE COMPANY

Midland, Pa.

Purchasing Agent: H. S. Neal.

One barge for Southern Cotton Oil Co., 100x35x7 ft.; keel Nov. 15/26; **launched Dec. 1/26.**

Fifteen barges for Inland Waterways Corporation, 126'x33'x7'6"; 6 keels laid; **5 launched.**

Steel sand and gravel dredge hull for E. T. Slider, New Albany, Ind.; 175'x50'x6"; keel Mar. 1/27 est

MIDLAND SHIPBUILDING COMPANY, LTD.

Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

City of Hamilton, hull 18, package freighter for Canada Steamships, Ltd.; 250 L.O.A.; 38 beam; 23 depth; T.E. engs.; keel Oct 11/26; launch Jan. 12/27 est.; deliver Apr 15/27 est.

City of Montreal, hull 19, package freighter same as above; keel Oct. 11/26; launch Jan. 12/27 est.; deliver Apr 15/27 est.

Not named, hull 20, package freighter for Canada Steamship Lines, Ltd.: 250 L.B.P.; 42 beam; 26 ft. 6 in. draft; keel spring /27 est.

Not named, hull 21, sister to above, keel spring /27 est.

NASHVILLE BRIDGE COMPANY

Nashville, Tenn.

Purchasing Agent: Leo E. Wege.

Hull 108, dredge for same firm; clam shell bucket type; 110'x51'6"x8'; steam eng.; keel Jan. 25/27 est.

Hull 111, deck barge for stock, 160 L.B.P.; 24 beam; 5 loaded draft; keel Oct. 18/26, **launched and delivered Dec. 10/26.**

Hull 112, deck barge for stock; 100x24x5 ft.; keel Nov. 12/26; **launched Dec. 21/26.**

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas: Plummer, 233 Broadway New York City.

Iroquois, hull 306, passenger and freight steamship for Clyde Steamship Company, New York, 407'-3" overall, 62'-0" beam, 30'-6" depth, Newport News turbines and gear; 8500 I.H.P.; Scocth boilers; oil burning; keel March 20/26; **launched Dec. 11/26.**

Shawnee, hull 307, sister to above; keel May 15/26, launch Feb. /27 est

California, hull 315, 18-knot, passenger liner for Panama Pacific Line, New York; 600 ft. long, 80 ft. beam, 52 ft. depth; watertube boilers for oil 22,000 gross tons; 17,000 I.H.P.; keel Mar. 20/26; launch /27 est.

Algonquin, hull 317, passenger and freight steamship for Clyde Steamship Co., New York, 402'-0" overall, 55"-0" beam, 31'-6" depth; Newport News turbines and gears; Scotch boilers for oil burning: keel March 23/26; launched Sept. 9/26; **delivered Dec. 8/26.**

Northland, hull 318, coast guard cutter for U. S. Government; 216' long; 39' beam; 24'9" draft; diesel-electric propulsion: McIntosh & Seymour engs.; keel Aug 16/26, launch Feb. /27 est.

Caracas, hull 319, passenger and freight steamer for Red D Line, New York; 335'4" L.O.A.; 51' beam; 22' draft; Newport News turbines and gears; water-tube boilers; 3560 D.W.T.; 4000 S.H.P.; keel Nov. 18/26.

THE PUSEY & JONES CO.

Wilmington, Del.

Purchasing Agent: James Bradford.

Not named, hull 1031, single screw passenger **freight steamer for Baltimore & Philadelphia Steamboat Co., Philadelphia; 219 L.B.P.; 45 beam; 11 loaded draft; 14½ mi speed; 4 crank, TE engs. 21-32-35-35 by 24": two B. & W. water-tube** boilers, 3046 sq. ft. heating surface each.

Not named, hull 1033, steel single screw day steamer for Hudson River Day Line, New York; 252 L.B.P.; 46 beam; 4-cycle, triple expansion engs.; 2800 I.H.P.; 4 B. & W. water-tube boilers; 11x12 200 lbs. pressure; keel Sept. 15/26; launch Jan. 15/27 est.

STATEN ISLAND SHIPBUILDING COMPANY

Staten Island, N. Y.

Purchasing agent: R. C. Miller.

American Legion, hull 764, ferryboat for City of New York, 264 L.O.A.; 66 beam over-all, 47 beam mld.; 14 loaded draft; 15 mi. speed; abt. 2600 gro. tons; 2 comp. engines, 3500 I.H.P.; 4 W.T. boilers; keel Feb. 8/26; launched Sept. 29/26; deliver Feb. 15/27 est.

No. 33, hull 765, tugboat hull for New York Central R.R.; 96'x26'x10'-3"; 12 knots speed; 200 gr. tons; 650 I.H.P. diesel-electric prop. unit; keel Mar. 29/26; **delivered Dec. 14/26.**

No. 34, hull 766; tugboat, sister to above; keel Apr. 8/26; launched Oct. 15/26; **delivered Jan. 6/27.**

Meitowax, hull 768, tugboat for Long Island Railroad Co.; 108' L.O.A.; 26' beam; 13'2" molded depth; diesel-electric propulsion; keel June 16/26; launched Nov. 27/26; deliver Feb. 15/27 est.

Hull 769, grain elevator for International Elevating Co.; 130 L.O.A.; 35 beam; 9 loaded draft forward 11 loaded draft aft.; diesel engs.; keel Sept. 30/26; launch Jan./27 est.

Hull 771, steel caisson for Mid-Hudson Bridge.

Hull 772, steel caisson for Mid-Hudson Bridge.

SUN SHIPBUILDING COMPANY

Chester, Penn.

Purchasing Agent: H. W. Scott.

Hull 98, hydraulic dredge for American Dredging Co.; 110x31'10"x10'; keel Aug. 10/26; **launched Jan. 4/27.**

Hull 99, stern-wheel towboat for International Petroleum Co.; 160'x44'x5'; 3'3" draft; 750 I.H.P. engs.; keel Aug. 30/26; **launched Nov. 20/26; delivered Dec. 11/26.**

Hull 100, one oil barge for Proctor & Gamble, 150'x40'x13'; 1200 tons capacity; keel Oct. 4/26; **launched Dec. 18/26; delivered Dec. 22/26.**

Not named, hull 101, twin screw motor tank barge for Gulf Refining Co.; 136'x27'x11'6"; 400 B.H.P. engs.; to carry 385 tons on 9' draft; 9 mi. speed; **keel Dec. 2/26.**

Not named, hull 102, sister to above; **keel Dec. 2/26.**

Not named, hull 103, twin screw motor tank barge for Tidewater Oil Co.; 252' long; 40' beam; 14' depth; to carry 1885 tons on 12' draft; 10 mi. speed; **keel Jan. 3/27.**

Not named, hull 104, single screw bulk oil steamer, owner not named; 480' long; 65' 9" beam; 37" depth; to carry 13,000 tons on 27'6" draft; speed 1½ knots; 4250 I.H.P.

TOLEDO SHIPBUILDING CO.

Toledo, Ohio.

Purchasing Agent: Otto Hall.

Not named, hull 177, car ferry for Wabash Ry. Co.; 388 L.B.P.; 57'6" beam; 16' loaded draft; 15 mi. speed; 2500 D.W.T.; T.E. engs.; 2500 I.H.P.; 4 Scotch boilers, 14'6" diam.; keel Nov. /26; launch Jan. /27 est.; deliver Mar. /27 est.

Not named, freighter, hull 178, for Pittsburgh Steamship Co.; 580 L.B.P.; 60' beam; 19' loaded draft; 12½ mi. speed; 12,500 D.W.T.; T.E. engs.; 2500 I.H.P.; 3 Scotch boilers, 14' diam,; keel Jan. /27 est.; launch May/27 est.; deliver July/27 est.

TODD ENGINEERING, DRYDOCK & REPAIR CORP.

Brooklyn, N. Y.

Purchasing Agent. H. J. Shannon.

Vidor, hull 39, steel twin-screw diesel motor yacnt for S. P. Davis; 162' 10" L.B.P.; 27' 4" beam, 13' loaded draft; 14 mi. speed; 2 Bessemer diesel engs.; 800 S.H.P. ea.; keel March 25/26; launched May 25/26; deliver Nov. 15/26 est.

THE CHARLES WARD ENGINEERING WORKS

Charleston, W. Va.

Purchasing Agent: E. T. Jones

Hull 51, steel barge for W. C. Kelly Barge Line; keel Aug. 24/26; launched Oct. 25/26; **delivered Nov. 29/26.**

Hull 53, same as above, keel Sept. 30/26

Hull 54, same as above; keel Sept. 29/26

Hull 55, same as above. **keel Jan. 3/27.**

Hull 56, same as above.

Hull 57, same as above.

Hull 58, same as above.

Hull 59, same as above.

W. A. Shepard, hull 60, towboat for W. C. Kelly Barge Line; screw propeller, 2 Fairbanks-Morse diesel engs.; 720 B.H.P.; keel Sept. 23/26; launch Jan. 11/27 est.

Duncan Bruce, hull 61, stern-wheel towboat, for W. C. Kelly Barge Line; 135'x35'x6'; Fairbanks-Morse diesel engs.; keel Jan. 20/27 est; launch Feb. 28/27 est.

Repairs

GENERAL ENGINEERING AND DRY DOCK COMPANY

Alameda, California

Install oil burning system: stmrs. Corrales and Corsicana. Drydock, clean, paint: tug Sea Lion (also install new wheel), Makena (eng. repairs), Siskiyou (general engine and deck repairs), C. A. C. stmr. Capt. Gregory Barrett, Daisy Freeman (pull tail shaft), Col. Geo. Armistead, schr. Latouche (eng. and deck repairs). Extensive alterations and repairs: Salatiga. Drydock, clean paint, general repairs to engine and deck, remove and install propellers: Golden State. Drydock, general eng. and deck repairs: Golden Gate. Misc. damage repairs: stmr. J. D. Peters. Boiler, deck, and eng. repairs: stmr. Midway, Kanak. Boiler and misc. repairs: stmr. Pyramid. Repairs to stanchions and beams around boiler: stmr. Idaho. Misc. repairs: stmrs. Stanwood, Phyllis, Coquina, Normandie, ferryboat Golden West.

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.

San Pedro, Calif.

New bottom built into vessel, account of damage; stmr. Solano. Dock for survey and repair account of grounding: yacht Poinsettia. Dock for survey and repair due to collision damage: yacht Invader.

THE MOORE DRY DOCK COMPANY

Oakland, Calif.

Drydock, paint, engine and deck repairs: stmrs. Tulsagas, West Nivaria, Coalinga (also hull repairs). Drydock, paint, misc. repairs: Henry J. Biddle, Olympic, Lake Francis, Montpelier, Crolona, Makena, Tamaha, Margaret Dollar, West Sequana. Drydock, damage and misc. repairs: Stmr. West Mingo. Drydock, paint, misc. repairs, also extra boiler work and renewed stem: barge California. Drydock, paint, new stem: tug Sea Ranger. Deck and eng. repairs: stmrs. Grace Dollar, S. C. T. Dodd, Edward T Jefferey, Arctic. Misc. eng. repairs: Alaska. Piston rings: m.s. Elmback. Boiler test and misc. repairs: El Capitan. Extensive misc. repairs: stmrs Stockton, Matsonia, Cascade. Deck and engine repairs: stmrs. Melville Dollar, South Coast, Stuart Dollar. Misc. repairs: stmrs. Robert Johnson, San Pedro, U. S. C. G. cutter Bear, Grace Dollar, S C. T. Dodd.

PRINCE RUPERT DRY DOCK & SHIPYARDS

Prince Rupert, B.C.

Docked, cleaned, painted, repairs to sheathing and stanchions: barge Pioneer. Docked, cleaned, painted, misc. hull and machinery repairs: 3 fishing boats. Misc. hull and engine repairs: 14 fishing boats. Lined for grain loading: stmrs. Meigen Maru, Ypres Maru, Kifuka Maru, Taiyu Maru. Docked for examination, 6 ft. of seam caulked, misc mach. work: stmr. Taiyu Maru. 76 other commercial jobs during Dec.

VICTORIA MACHINERY DEPOT CO., LTD.,

Victoria, B.C.

Deck and hull repairs: stmr. Bingamon. Dock, clean, paint, hull repairs: C.G.s. Madge. Dock, clean, paint, propeller and tail shaft repairs, eng. and hull repairs: tug Red Fir. Boiler repairs: tugs Superior and Olive M.

Who's Who afloat ashore

Edited by Jerry Scanlon

With civic, government, and maritime officials present, dedication of the new Marine Exchange lookout station was held at 4 o'clock on February 1st. The ceremonies marked the official opening of what is declared to be the finest and most modern maritime observatory in the world.

Situated on the bluff at Point Lobos at an elevation of more than 250 feet above the sea level, the station's keeper, Captain Julius Larsen, on clear days will have a visibility of more than forty miles seaward.

With the station dressed in the house flags of all steamship lines plying in and out of the port of San Francisco and with all craft sailing in and out of the Golden Gate dipping their flags and sounding their whistles as they came abeam of Mile Rock Lighthouse, the dedication presented a colorful ceremony.

Addresses outlining the history of the Marine Exchange, which is under the control of the marine committee of the San Francisco Chamber of Commerce, were made by John C. Rohlfs, manager of the marine department of the Standard Oil Company, who is chairman of the Marine Exchange Committee; Frank J. O'Connor, manager of the Donovan Lumber Company, vice-chairman; and Abe Marks, manager of the Marine Exchange.

Latest picture of Captain Robert Dollar

Chief Engineer William Joyce, champion golfer of the I. M. M. fleet.

Clay H. Miller, president of the Chamber of Commerce, outlined the important work that the Marine Exchange has done in giving invaluable information to the shipping companies and affiliated interests of San Francisco. The first lookout station was inaugurated in 1848 by Sweeney and Bough, who signalled by means of a wooden semaphore from the top of Telegraph Hill. In 1866 the Merchants Exchange took charge of the station and have operated it successfully ever since.

Appointment of **R. N. Miller** as marine superintendent for the Gulf jurisdiction of **Swayne & Hoyt, Inc.,** was announced by Superintendent Engineer Henry Gelhaus. Mr. Miller assumed his new duties February 1 at New Orleans. Mr. Miller was for many years superintendent engineer for the Charles Nelson Company. He was tendered a farewell luncheon and presented with a traveling bag by his many San Francisco friends before departing.

Although **Melville Dollar,** son of Robert Dollar, dean of the American steamship world, came to San Francisco from his headquarters in Vancouver with the intention of remaining one day, he was forced to spend three days in this city.

When he appeared on the floor of the Exchange he was surrounded by many friends. Under the leadership of George Armes, president of the General Engineering and Drydock Company, Mr. Dollar was the guest of honor at duck dinners and entertainments that were staged until the eve of his departure.

"San Francisco's hospitality grows instead of diminishes, and it is certainly hard to break away from here," said Mr. Dollar as he boarded the train for the return home.

William J. Blake, formerly chief engineer of the liner Wilhelmina of the Matson Navigation Company, resigned his post and starting the first of this month assumed the position of port engineer of the **Charles Nelson Company** at San Francisco. He succeeded R. N. Miller who is now marine superintendent at New Orleans for Swayne & Hoyt, Inc.

During the war Mr. Blake served as chief engineer aboard the Wilhelmina and also in the same capacity aboard the steamer Zelandia when these two liners were running the submarine blockade on the Atlantic as troopships.

With repairs completed and after undergoing a general overhauling at The Moore Dry Dock Company, the steamer West Mingo is on the high seas en route from the Pacific Coast to Dublin and Liverpool in command of a personnel of California resident deck officers and engine room crew.

Captain N. R. Freericks, formerly on vessels of the defunct Atlantic, Gulf and Pacific Steamship Company, is master and **James Wilson** is chief officer. The latter was formerly on Luckenbach intercoastal carriers. **R.**

(Continued on Page 16)

Captain H. L. Jones, master of the Dollar liner President Lincoln

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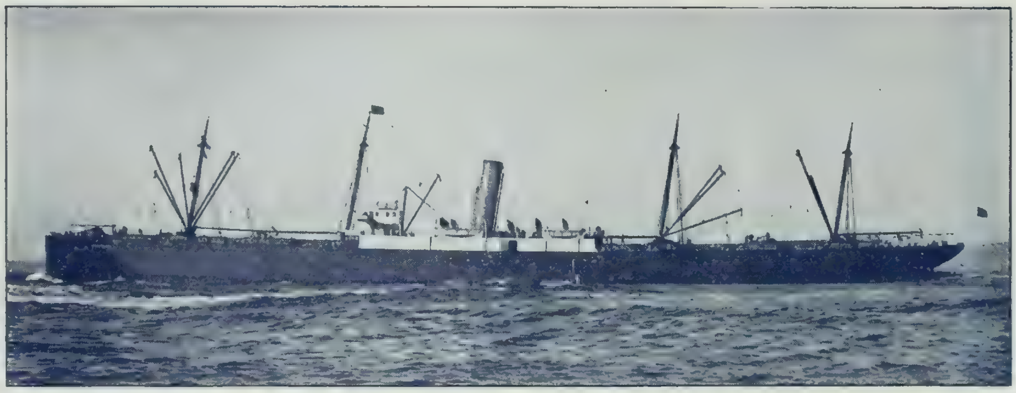

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C. L. Gibb, assistant agent.
Tribune Tower, Oakland. Phone Oakland 1022

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SAILINGS—Every 4 days from San Francisco, Oakland, Alameda, and Los Angeles to New York, Philadelphia, and Boston.

SAILINGS—Every 20 days from Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, Alameda and Los Angeles, to Charleston, S. C.

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ARROW LINE
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230 California street. Phone Garfield 2846

FREIGHT ONLY.

SAILINGS—Westbound.

Weekly from Baltimore, fortnightly from Norfolk and Savannah to Los Angeles, San Francisco, Oakland, Portland, and Seattle.

CALIFORNIA & EASTERN S.S. CO.
325 Merchants' Exchange Bldg Ph. Kearny 1610 and Kearny 144

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DOLLAR STEAMSHIP LINE
The Robert Dollar Co.
311 California street. Phone Garfield 4300
Oakland office: 406 Thirteenth St.

PASSENGERS AND FREIGHT.

SAILINGS—Fortnightly from Boston and New York to Los Angeles and San Francisco.

FREIGHT ONLY.

SAILINGS—Regularly between San Francisco, Seattle, Los Angeles, New York, Philadelphia, Baltimore, and Norfolk

GULF PACIFIC LINE
Swayne & Hoyt, Inc., managers.
430 Sansome street Phone Davenport 6700

FREIGHT ONLY.

SAILINGS—Semi-monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco, and Los Angeles to Puerto Colombia, Curacao, Houston, Beaumont, Tampa, Mobile, New Orleans, calling at Oakland westbound.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents
230 California street. Phone Sutter 3600

FREIGHT ONLY.

SAILINGS—Intercoastal Service.

Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego, and New York, Boston, Providence, Philadelphia, Baltimore, Norfolk, and Portland, Me.

SAILINGS—Hawaiian Service.

Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also monthly direct to Hawaii from Philadelphia, Boston and New York.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc
201 California Street. Phone Davenport 7600
Oakland Office and Dock: 1st and Market Sts
Phone Lakeside 1383.

FREIGHT ONLY.

SAILINGS—North Atlantic-Intercostal.

Every Tuesday from Seattle, every Saturday from Portland, every Thursday from San Francisco, and every Saturday from Los Angeles; also every seven days from Tacoma, Vancouver, and Oakland, to Philadelphia, New York, and Boston.

SAILINGS—Gulf.

Every 16 days from Seattle, Tacoma, Vancouver, Portland, San Francisco, Oakland and Los Angeles to New Orleans, Houston, and Mobile; also alternately calling at Galveston and Beaumont.

MUNSON-McCORMICK LINE
McCormick Steamship Co., Pacific Coast agents
215 Market street. Phone Davenport 3500.

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SAILINGS—Regularly between New York and Baltimore and Los Angeles, San Francisco, Oakland, Portland, Seattle, and Tacoma.

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Baltimore (westbound) and Los Angeles.

SAILINGS—Pacific Havana-Jacksonville Line.

Monthly from Seattle, Tacoma, Portland, San Francisco, and Los Angeles to Havana, Cuba, and Jacksonville, Florida.

PANAMA MAIL STEAMSHIP CO.
2 Pine street. Phone Sutter 3800.

PASSENGERS AND FREIGHT.

SAILINGS—Every 21 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, and New York. Westward calls: New York, Puerto Colombia, Cartagena, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Los Angeles, and San Francisco.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Passenger and General Offices: 460 Market St Phone Douglas 8680.
Freight and Operating Offices: Pacific Steamship Co., 311 California St. Phone Davenport 3300

PASSENGERS AND FREIGHT.

SAILINGS—Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle, and Tacoma

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285 Federal Telegraph Bldg., Oakland Phone Lakeside 3580.

FREIGHT ONLY.

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WILLIAMS LINE
Williams Steamship Company, Inc
110 California street. Phone Douglas 1670
A F Zipf, Pacific Coast manager.

FREIGHT ONLY.

SAILINGS—Twice monthly between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, San Diego, and New York, Philadelphia, Norfolk, and Baltimore

SEATTLE

AMERICAN-HAWAIIAN S. S. CO.
Henry Dearborn, agent.
Mutual Life Bldg. Phone Eliot 8120
Tacoma: Baker Dock. Phone Main 2243.

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SAILINGS—Every 9 days from Seattle, Tacoma, Portland, Astoria to New York, Philadelphia, and Boston.

SAILINGS—Every 20 days from Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, Alameda, and Los Angeles to Charleston, S.C.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents
Alaska Building. Phone ELiot 2450.

FREIGHT ONLY.

SAILINGS—Every 20 days from Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, land, San Francisco, and Los Angeles and New York, Boston, Providence, Philadelphia, Baltimore, Norfolk, and Portland, Me.

ARROW LINE
Sudden & Christenson, agents
Arctic Building.

FREIGHT ONLY.

SAILINGS—Westbound.

Weekly from Baltimore, fortnightly from Norfolk and Savannah to Los Angeles, San Francisco, Oakland, Portland, and Seattle.

CALIFORNIA & EASTERN S.S. CO.
Johnson Shipping Co., Inc., Agents.
5546 White Henry Stuart Bldg.

FREIGHT ONLY.

SAILINGS—Monthly from New York, Philadelphia, and Baltimore to Los Angeles, San Francisco, Oakland, and Seattle.

DOLLAR STEAMSHIP LINE
Admiral Oriental Line, agent.
1519 Railroad Ave. S Phone ELiot 2068

FREIGHT ONLY.

SAILINGS—Regular sailings between Seattle, San Francisco, Los Angeles, and New York, Philadelphia, Baltimore, and Norfolk

GULF PACIFIC LINE
Swayne & Hoyt, Inc., managers.
Suite 201, Central Bldg. Phone ELiot 6383.

SAILINGS—Semi-monthly from Seattle and Puget Sound, Portland, and Columbia River, San Francisco, and Los Angeles to Puerto Colombia, Curacao, Houston, Beaumont, Tampa, Mobile, New Orleans, calling at Oakland westbound.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents
Alaska Building. Phone ELiot 2450.

FREIGHT ONLY.

SAILINGS—Intercoastal Service.

Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego, and New York, Boston, Providence, Philadelphia, Baltimore, Norfolk, and Portland, Me.

SAILINGS—Hawaiian Service.

Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also monthly direct to Hawaii from Philadelphia, Boston and New York.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
L C Smith Building. Phone ELiot 1206

FREIGHT ONLY.

SAILINGS—North Atlantic-Intercoastal.

Every Tuesday from Seattle, every Saturday from Portland, every Thursday from San Francisco, and every Saturday from Los Angeles; also every seven days from Vancouver, Tacoma, and Oakland, to Philadelphia, New York and Boston.

Sailings—Gulf.

Every 16 days from Seattle, Tacoma, Vancouver, Portland, San Francisco, Oakland and Los Angeles to New Orleans, Houston, and Mobile; also alternately calling at Galveston and Beaumont

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S.S. Colombia	Feb. 19	Feb. 21
M.S. City of Panama	Feb. 26	Feb. 28
S.S. Venezuela	Mar. 12	Mar. 14
M.S. City of S.F.	Mar. 19	Mar. 21
S.S. Ecuador	Apr. 2	Apr. 4

From New York—Cristobal		
S.S. Venezuela	Feb. 5	Feb. 15
M.S. City of S.F.	—	Feb. 16
S.S. Ecuador	Feb. 26	Mar. 8
S.S. Corinto	—	Mar. 9
M.S. City of Panama	—	Mar. 25
S.S. Colombia	Mar. 26	April 5

*—Ports of Call—Mazatlan, Champerico, San Jose de Guatemala, Acajutla, La Libertad, La Union, Amapala, Corinto, San Juan del Sur, Puntarenas, Balboa and Cristobal.

†—Ports of call—Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal and (Havana eastbound only), Cartagena and Puerto Colombia (Westbound only), and New York.

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EXPRESS SEA SERVICE
LUCKENBACH LINE
"The Largest and Fastest Freighters in the Intercoastal Trade"

Who's Who

Continued from Page 13

A. Fraser, who resides in Long Beach and has sailed the Pacific for many years, is chief engineer on the West Mingo.

The vessel was purchased from the Shipping Board by the California & Eastern Steamship Company, after lying idle for several years on the mudflats at Benicia. Along with the West Keats, West Montop, and West Katan, the West Mingo will maintain the intercoastal service for the California & Eastern Steamship Company, after completing her European trip.

San Francisco steamship men were afforded a fine opportunity of inspecting a model of the motorship Silveray, which was put on display on the main floor of the American Trust Company during January.

The model is eight feet in length and was sent by J. L. Thompsons and Sons, Ltd., of Sunderland, England, builders of a fleet of motorships of this type for the California-Oriental service of the Kerr Steamship Company, Inc. of New York, for which the General Steamship Corporation are general Pacific Coast agents.

Captain Robert Dollar, head of the steamship company which bears his name, **R. Stanley Dollar,** vice-president and general manager, **Hugh McKenzie,** general passenger manager, and **M. J. Buckley,** traffic manager were the guests of honor at a celebration staged by the Los Angeles Chamber of Commerce and civic officials of that city on the occasion of the arrival of the liner President Lincoln at Los Angeles harbor on January 31.

The President Lincoln marked the first of the Dollar transpacific liners that are to call at Los Angeles harbor on each return trip from the Orient. The vessels that will make Los Angeles harbor a port of call in the changed schedule are the President Taft, President Lincoln, President Pierce, and President Cleveland.

These four liners will sail from San Francisco to Manila via way ports,

Continued on Page 20

ORIENTAL

PORTLAND

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)

616 Porter Bldg. Phone MAin 4113.

FREIGHT ONLY.

SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.

OCEAN TRANSPORT CO., LTD.

General Steamship Corporation, agents.

Motoramp Building. Phone Broadway 6714.

FREIGHT ONLY.

SAILINGS—Fortnightly from Portland, Puget Sound, and Vancouver to Japan and North China ports.

OREGON ORIENTAL LINE

(Operating U. S. S. B. vessels).

Columbia Pacific Shipping Company.

Porter Building. Phone Broadway 5360.

FREIGHT ONLY.

SAILINGS—Every 3 weeks from Portland to Orient, calling at Yokohama, Kobe, Shanghai, Taku Bar and Dairen, returning via San Francisco.

Every 2 weeks from Portland to Yokohama, Kobe, Hongkong, and Manila, returning direct to Portland.

TATSUUMA KISEN KAISHA

Walker Ross, Inc., General Agents.

Board of Trade Bldg. Phone Broadway 7574.

FREIGHT ONLY.

SAILINGS—Monthly from Portland to Yokohama and Kobe; or Osaka, Nagoya as inducements offer.

YAMASHITA KISEN KABUSHIKI KAISHA

Yamashita Company, 1109 Porter Building.

FREIGHT ONLY.

SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe, and irregular service from China and Japan ports to San Francisco, Portland, and Seattle.

VANCOUVER

BLUE FUNNEL LINE, LTD.

Dodwell & Co., Ltd., agents.

Yorkshire Building. Phone Seymour 9576.

PASSENGERS AND FREIGHT.

SAILINGS—Every 21 days from Vancouver, Victoria, and Seattle to Yokohama, Kobe, Miike, and Hongkong

CANADIAN PACIFIC STEAMSHIPS, LTD.

Canadian Pacific Railway Station. Phone Seymour 2630.

PASSENGERS AND FREIGHT.

SAILINGS—Every 14 days from Vancouver to Japanese ports, Shanghai, Hongkong, and Manila

OSAKA SHOSEN KAISHA

Empire Shipping Company, Ltd.

815 Hastings St., W. Phone Seymour 8014.

PASSENGERS AND FREIGHT.

SAILINGS—Every 2 weeks to all ports in Japan and China, also Vladivostok, Singapore, Bombay, etc.

SUZUKI & COMPANY, Ltd.

E. L. Johnson, Walton & Company, agents.

837 Hastings street, W. Phone Seymour 7147.

FREIGHT ONLY.

SAILINGS—Irregular service between Pacific Coast ports and Japan ports

WALKER-ROSS, INC.

Canadian American Shipping Company, Ltd.

Phone Seymour 2198.

FREIGHT ONLY.

SAILINGS—Regular service to Yokohama, Kobe, Osaka, and Nagoya.

YAMASHITA KISEN KABUSHIKI KAISHA

Yamashita Co., Inc.

Merchants Exchange Building.

FREIGHT ONLY.

SAILINGS—Every 2 weeks to Yokohama, Kobe, Osaka, and Nagoya.

UNITED KINGDOM—Continental Europe

SAN FRANCISCO

EAST ASIATIC COMPANY, LTD.

The East Asiatic Company, Inc., agents.

[illegible] California street. Phone Davenport 6717

PASSENGERS AND FREIGHT.

SAILINGS—Regular service, Pacific Coast ports, direct to Hamburg, Hull, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.

Norton, Lilly & Company, general agents

230 California street Pone Sutter 3600

FREIGHT ONLY.

SAILINGS—Monthly from Vancouver, Puget Sound, Portland, San Francisco, Los Angeles, San Diego to Liverpool, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports, via Hull.

FRENCH LINE

(Compagnie Generale Transatlantique).

General Steamship Corporation, sub-agents

240 Battery street. Phone Kearny 4100.

FREIGHT ONLY.

SAILINGS—Fortnightly from Vancouver, Seattle, Portland, San Francisco and Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE

Furness, Withy & Company, Ltd.

Furness (Pacific), Ltd.

[illegible] Balfour Building. Phone Kearny [illegible]

PASSENGERS AND FREIGHT.

SAILINGS—Fortnightly from Vancouver, Seattle, Tacoma, Portland, San Francisco and Los Angeles to London, Liverpool, Manchester, and Glasgow

GENERAL STEAMSHIP CORP.

240 Battery street. Phone Kearny 4100.

FREIGHT ONLY.

SAILINGS—From Pacific Coast ports to London, Hull, Leith, Scandinavian, and Irish ports as inducements offer.

HARRISON DIRECT LINE

Balfour Guthrie & Company.

351 California street. Phone Sutter 6427.

FREIGHT ONLY.

SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco, Oakland, and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

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E. C. Evans & Sons, general agents.

[illegible] California street. Phone Davenport 8640.

FREIGHT ONLY.

SAILINGS—Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Avonmouth, and other United Kingdom ports as inducements offer.

JOHNSON LINE

W R Grace & Co , general agents

332 Pine street Phone Sutter 3700.

PASSENGERS AND FREIGHT. (Refrigeration.)

SAILINGS — Monthly between Pacific Coast ports and Bergen, Oslo, Gothenberg, Malmo, Copenhagen, Stockholm, and Helsingfors

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General Steamship Corporation, agents.

240 Battery street. Phone Kearny 4100.

PASSENGERS AND FREIGHT.

SAILINGS—Mediterranean Service.

Monthly sailings from Pacific Coast ports to Trieste, Leghorn, Genoa, Naples, and Barcelona; also Canary Islands.

PASSENGERS AND FREIGHT.

SAILINGS—African Service.

Monthly from Pacific Coast ports; through bills of lading being issued for principal ports of West, East, and South Africa, with transshipment at Genoa or Naples

NORTH PACIFIC COAST LINE

(Joint service of the Royal Mail Steam Packet Company and Holland America Line).

120 Market street. Phone Douglas 7510.

PASSENGERS AND FREIGHT.

SAILINGS—Every 2 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Oakland, Los Angeles, and Liverpool, London, Rotterdam, Antwerp, Hamburg, Southampton, Glasgow

NORWAY PACIFIC LINE

485 California street. Phone Sutter 5099.

FREIGHT ONLY.

SAILINGS—Every 30 days from San Francisco and Los Angeles to United Kingdom, Continental ports and Scandinavia.

SOCIETE GENERALE DE TRANSPORTS MARITIMES A VAPEUR

Norton, Lilly & Company, general agents.

230 California street. Phone Sutter 3600

FREIGHT ONLY.

SAILINGS—From Seattle, Portland, San Francisco, and Los Angeles to Marseilles and Genoa as inducements offer

UNITED AMERICAN LINES, INC.

Sudden & Christenson, Pacific Coast agents.

230 California street. Phone Garfield 2846.

For passengers. Phone Sutter 46.

PASSENGERS AND FREIGHT.

SAILINGS—Fortnightly from Vancouver, Seattle, Portland, San Francisco, and Los Angeles, to Antwerp, Hamburg, and Bremen; with call at United Kingdom ports when inducements justify.

SEATTLE

EAST ASIATIC COMPANY, LTD.

The East Asiatic Company, Inc., agents.

1222 Alaska Building. Phone ELiot 9104

PASSENGERS AND FREIGHT.

SAILINGS—Regular service, Pacific Coast ports direct to Hamburg, Hull, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.

Norton, Lilly & Company, general agents

Alaska Building. Phone ELiot 2450.

FREIGHT ONLY.

SAILINGS—Monthly from Vancouver, Puget Sound, Portland, San Francisco, Los Angeles, San Diego to Liverpool, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports, via Hull.

FRENCH LINE

(Compagnie Generale Transatlantique).

General Steamship Corporation, agents

Colman Building. Phone ELiot 5706.

FREIGHT ONLY.

SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE

(Furness, Withy & Company, Ltd).

Furness (Pacific), Ltd.

Burchard & Fisken, Inc., agents

705 Arctic Building.

PASSENGERS AND FREIGHT.

SAILINGS—Fortnightly from Vancouver, Seattle, Tacoma, Portland, San Francisco and Los Angeles to London, Liverpool, Manchester and Glasgow.

GENERAL STEAMSHIP CORP.

Colman Building. Phone ELiot 5706.

SAILINGS—From Pacific Coast ports to London, Hull, Leith, also Scandinavian and Irish ports as inducements offer

HARRISON DIRECT LINE

Balfour, Guthrie & Company.

Dexter Horton Bldg Phone ELiot 1464

FREIGHT ONLY.

SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco, Oakland, and Los Angeles to United Kingdom. From August to December, sailings fortnightly

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FURNESS [Pacific], Ltd.
Pacific Coast Agents
VANCOUVER SEATTLE PORTLAND
SAN FRANCISCO LOS ANGELES

Who's Who

(Continued from Page 20)

has deserted the sea to become interested in a San Francisco hostlery. Samson was formerly chief officer of the liner Ecuador.

Chief Engineer C. T. McFeeley of the Makiki is back in charge of the engine room, after a vacation spent in Southern California. **A. E. Nielson** who served as chief during Mr. McFeeley's shore-side is back at his old station as first assistant.

The engine room of the steamer El Capitan is now in charge of **Frank G. Skinner Jr.,** formerly first assistant engineer. He succeeded Chief Engineer James Finn, who is spending his time shoreside.

Earl A. Troski is now chief engineer of the **Swayne & Hoyt** carrier Elkridge. He has been assistant on a number of the company's vessels for many years and his promotion was in recognition of his efficient services. Other officers below deck are **Clarence Kane,** first assistant, **Marius H. Vester,** second, and **Alfred Solari,** third.

Harry Goldman is now chief engineer of the freighter West Elcajon of the Swayne & Hoyt fleet.

Four general agents of the Robert Dollar Steamship Company are now returning home after traveling to San Francisco from all parts of the world for the purpose of conferring with R. Stanley Dollar, M. J. Buckley, Hugh MacKenzie, and other executives of the organization in reference to plans for the 1927 activities of the round-the-world service and transpacific trade.

The officials, all of whom are widely known in Pacific Coast shipping circles, were **Robert Bruce,** of Chicago, **Thomas Cokely,** who was with the San Francisco offices for many years and is now in charge of the Singapore offices, **S. N. Stimpson** of Kobe, and **F. R. Marshal** of London. During their stay in San Francisco the quartet were the guests of honor at numerous functions staged by old-time steamship executives.

Accident Prevention Work In Passenger, Automobile and Freight Ferry Service

**William S. Wollner, General Safety, Fire Prevention & Welfare Agent,
Northwestern Pacific Railroad Co., San Francisco.**

DURING the year ending June 30, 1926, the number of persons carried as passengers on San Francisco Bay ferryboats was 57,775,456. During the year 1925 there were transported, in addition to passengers, 2,269,937 vehicles nearly all of which were automobiles and motor trucks.

Those who have visited "The City by the Golden Gate" know that the fleets of ferryboats there are the finest in the world and are maintained to an unusual standard of efficiency. Their cleanly appearance is the occasion of frequent remark by visitors. All passenger and vehicle ferries are of the double end type, while freight in cars is transported on both double end type ferries and barges propelled by tugs. The importance of ferry service on San Francisco Bay is demonstrated by the fact that there now is under construction for this service 12 vessels, two of the steam turbine electric drive type and ten of the diesel engine electric drive type.

It is more than 20 years since a passenger lost his life in a San Francisco Bay ferry accident, and a report recently submitted states that more than 750,000,000 passengers have been handled during the last 15 years without the loss of a single life.

With one exception the ferry fleets on San Francisco Bay are operated by the rail transportation systems of which they are a part, and as the ferry which is the exception has been operating for only a comparatively short period this paper will deal only with those operated by railroads. These are the Southern Pacific Company, Western Pacific Railroad Company, Atchison, Topeka & Santa Fe Railway Company, Northwestern Pacific Railroad Company, and the Key System Transit Company. One of these companies, the Southern Pacific, operates on San Francisco Bay and its tributaries the largest railroad ferry system in the world, its fleet consisting of seven passenger carrying steamers with a capacity each of from 2200 to 3500 passengers; eight automobile carrying steamers with a capacity each of from 45 to 75 automobiles; two composite steamers, three freight and passenger car transfer steamers, two of these being the largest in existence today; and a fireboat used exclusively to protect the company's ferry system. The Southern Pacific's ferries are handling an average of 77,400 persons daily, the average number of vehicles transported during 1925 having been more than 4000 daily.

The Key System Transit Company, which handles foot passengers only, transports an average of about 43,000 passengers daily.

Unquestionably, the reason why there has been such a high degree of safety in San Francisco Bay ferry service is because of the policy of the railroad companies operating the fleets—that nothing that will assure safety is to be left undone, coupled with the high ideals of safety that have always been a part of maritime life. Credit is due also to the United States Steamboat Inspection Service, which, in this territory, as elsewhere, has one standard only, this being that only the highest type of material, workmanship, and personnel will be permitted.

Safety of Employees

The Northwestern Pacific's marine department went through the entire year 1925 without a reportable accident to an employee. As a matter of fact, there has been only one marine worker injured during the past 24 months.

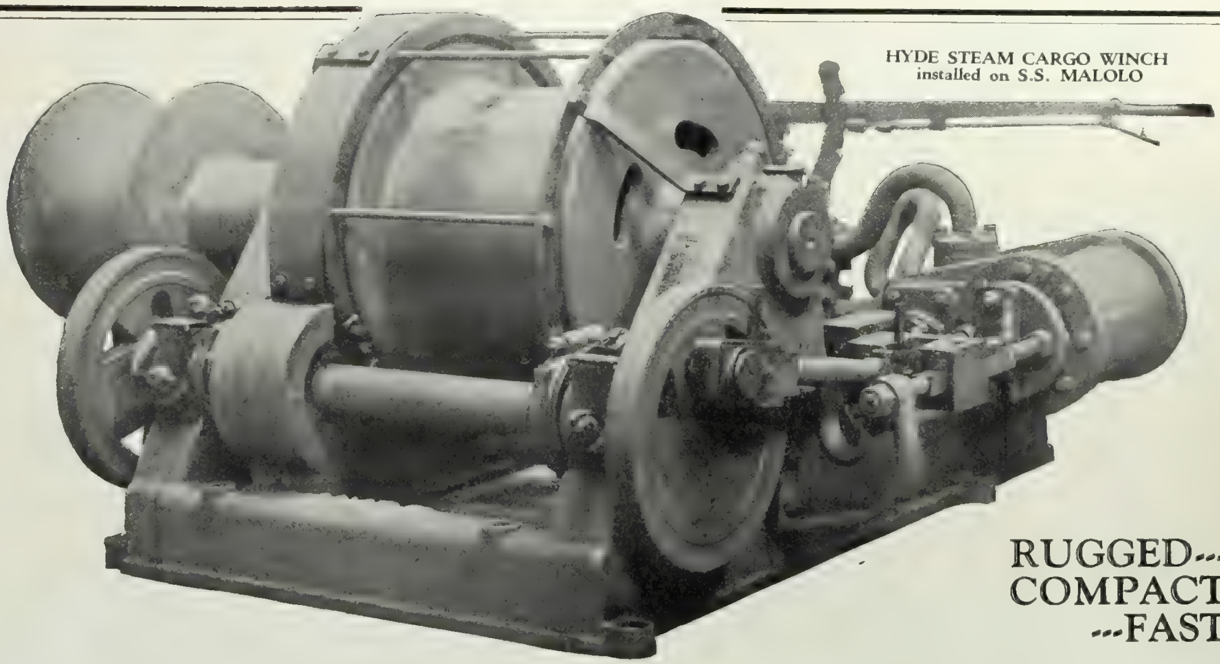
"This record did not happen; it was caused," and the cause is that the value of accident prevention is fully recognized by those in charge of Northwestern Pacific activities, and the entire personnel has been educated in the value of safety and the means by which it may be acquired. Over a period of a good many years there was a Northwestern Pacific employee accidentally killed on an average of every four months, but it is now nearly 37 months since an employee on duty met his death in an accident, the no-fatality period immediately preceding the present one having been nine months which was in itself a record on this road.

The Northwestern Pacific's marine fleet consists of four large double end ferryboats plying a course of more than six miles in each direction, a smaller vessel serving points on the Marin County shore, and a launch; in addition to which there are now in course of construction three steel hull, diesel engine, electric drive boats which will be the last word in ferry equipment. There are 155 employees in the ferry service, not including those in the steward's department.

The ferry service is a part of the road's motive power and equipment department, at the head of which is a general superintendent of motive power and equipment to whom all credit for the safety accomplishments of the marine service must go. The general superintendent has inculcated into his subordinate officers his enthusiastic belief that safety is well worth while and makes for more efficient service and a dollars-and-cents, as well as sentimental, credit on the balance sheet. The general superintendent holds each of his subordinates strictly accountable for every accident that occurs, and this applies to the marine service as well as to the shops, locomotive, and car departments. Every captain and chief engineer knows that if one of his men is injured, no matter how slightly, he will have to explain to the general superintendent personally the condition that made the occurrence of this accident possible.

This interview is no perfunctory matter; it is in truth an investigation to determine the underlying, as well as the immediate cause of the injury, and there are present, in addition to the officer, the injured man, his immediate supervisors and other employees, if they are involved. A stenographic report is taken of the investigation and the points it produces are made known to all others concerned, so that the occurrence of similar accidents may be forestalled. An outstanding feature of these investigations is the fairness with which they are conducted. The general superintendent demands the facts, he insists upon responsibility being placed where it belongs, he also insists that discipline shall not be assessed where it is not deserved.

(Continued on Page 57)



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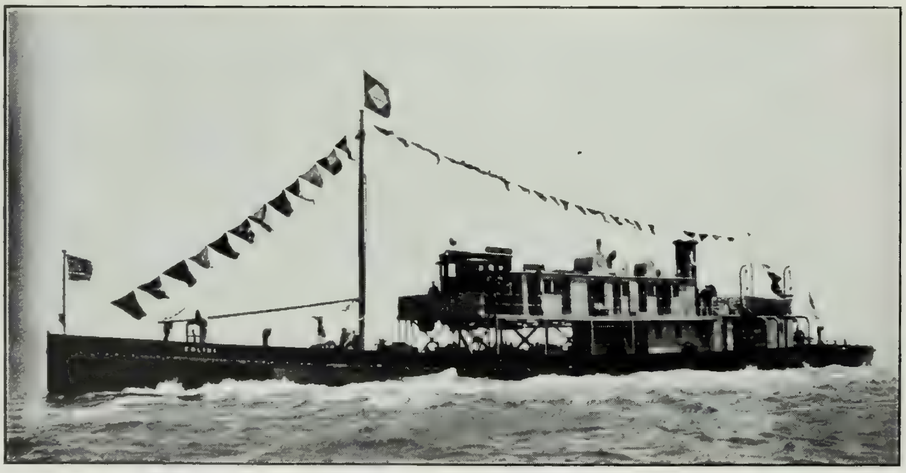

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Improved ventilation
Reduced vibration

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(Continued from Page 53)

The procedure in investigating the one accident that occurred during the past 24 months is illustrative of the general practice in the motive power department. A deckhand received lacerations and a broken knuckle when his hand was caught in the steering gear of one of the ferry steamers. The deckhand and first officer, under whom he was working at the time of the accident, and the captain of the vessel were called into conference. The man was working on the steering gear when the tool slipped off a nut when the gear was moved, catching his hand and inflicting the injuries stated. The report covering the accident, which not only went into the motive power department's files, but was also forwarded to the president and general manager and the general safety agent, recited these facts and in addition stated, "This accident could have been avoided if this work had been done when the vessel was not under way."

In other words, there is no inclination for the department as such to escape responsibility for the occurrence of an accident or to cover up such an occurrence, and this being the attitude of the department, the same spirit circulates through the organization. The underlying causes of the accident (in this case the work unnecessarily being done while the steamer was under way) having been determined, the facts are broadcast so as to avoid a repetition. The name of the first officer, under whom the deckhand was working at the time of the accident, was given in the report.

Another practice that has gone to the minimizing of accidents is that a statement of the accident and a copy of the transcript covering the investigation is attached to each employee's personal record and it is easily determined whether a man falls into the "careless" classification, or not.

A feature that has added much to the safety of workers on the Northwestern Pacific ferries, as well as fire protection, is that the boats are at all times completely electrically lighted and have full fire pressure on the water mains, even though there is not a pound of steam in the boilers. This is accomplished through the establishing of shore line connections to the vessels. High capacity electric lines are run to receptacles located in each ferry slip and at tie-up wharves. When a vessel is tied up, a jumper cable, with which it is equipped, is plugged into the receptacle. This cable is carried in conduit to the vessel's electric switchboard so that all that is necessary, after the cable has been connected to the shore line, is to throw a switch on the board in order to give full electric light service to all parts of the steamer. Similarly, a hydrant on the slip or wharf is connected through a hose to the ship's fire main and this gives 90 pounds of pressure to any hydrant on the boat. Fire hydrants are generously placed about the wharf property and in addition there is at least one fire monitor placed within practical reach of each slip.

Protecting the Public

The same degree of care that is exercised to protect the worker is also used to avoid injury to passengers. Nothing, no matter how unimportant it may seem at the moment, that will make accident occurrences less likely, has been allowed to remain undone. As an instance, it was noticed that when the gangways at terminals were lowered to load or discharge passengers from the upper deck, there was a space through which a child might fall. An accident of this kind had never occurred and the possibility of one occurring seemed extremely remote. It was a condition hard to correct as the space was located at the hinge of the gangway. It was, nevertheless, decided that if the proper amount of ingenuity were exercised, a guard could be devised, and the road's bridge department designed an appliance that fully met the situation. It did not cost a great deal of money to safeguard this point, but it did take will and a persistency that refused to be balked because the solution was not easy to find.

Ferrying Automobiles

The handling of automobiles offered a problem that was worthy of the best effort of any safety engineer. It should be remembered that this road's ferry steamers transport vehicles and passengers on the same trip. Its largest steamer, the Eureka, can transport 3500 passengers (2590 of them seated) each trip, in addition to automobiles carried in the main deck gangway. The settees on the main deck are removable and when they are not in place 95 automobiles can be carried on this deck and 1453 seated passengers in addition can be carried on the salon deck.

Transportation of automobiles and passengers on the same trip offers peculiar hazards, smoking being the gravest. The first problem was to isolate the foot passenger smoker from the motor vehicles, and while on the Eureka this has been done, it is not so easily accomplished on some of the other vessels. The means used on the Eureka has been the installation of folding gates that can be used exclusively for the placing of automobiles. These folding gates or railings have been ingeniously placed so that space may be allotted to anything from a few automobiles to the entire capacity of the deck. Foot passengers are not permitted to go within the inclosure.

Another smoking hazard comes from the automobile driver or passenger who stays within the vehicle and endeavors to insist upon smoking. The solution of the smoker problem on the Northwestern Pacific, which has now been adopted by the other companies operating on San Francisco Bay, was the inauguration of a "pyrene patrol." During all the time that there are automobiles on the ferry, even though there be only one car, one or more deckhands armed with a Pyrene extinguisher, which he carries in his hand or in a leather holster, remains in the vicinity of the car, or patrols the space where cars are placed. This is done for two purposes, first, to see that there is no smoking and second, to extinguish immediately any fire that might occur. The second officer of the vessel makes it his business to see that the patrol is constantly alert to its responsibility and the general safety agent makes inspections at frequent intervals to see that this matter is being given the attention it deserves. It is very often difficult to get people to discontinue smoking in the vicinity of motor cars and at times the road's police department has been used.

Another duty of the patrol is to see that drivers do not start their engines until the boat is moored in the slip and the vehicles are ready to move. This not only lessens the fire hazard, but materially decreases the quantity of carbon monoxide. A mechanical device meant to assist in solving the smoker problem is the placing of electrically illuminated signs in the gangways on the main deck of the boats. When there are automobiles in that portion of the boat the illuminated sign reads, "NO SMOKING," while the word "NO" is covered when that portion of the boat is not being occupied by cars.

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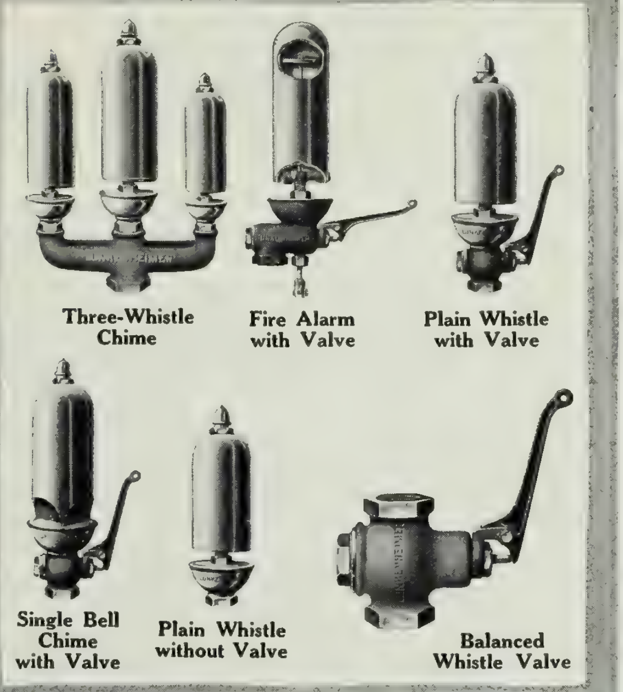

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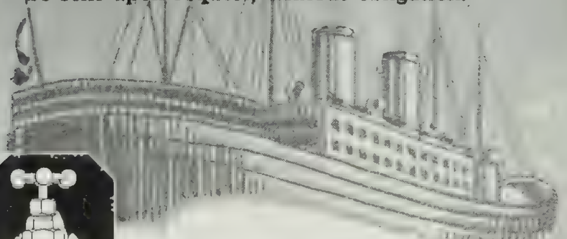

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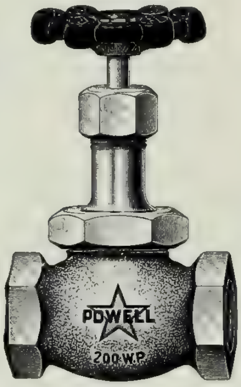

Fig. 110
Regrinding Globe Valve, Sizes 1/4 to 3-inch.

Bronze regrinding Model Star Valves are designed with union bonnets and regrindable without removal from the line.

In conformity with U.S. Steamboat inspection service valves above 2 inches in size are obtainable with bolted yoke bonnet.

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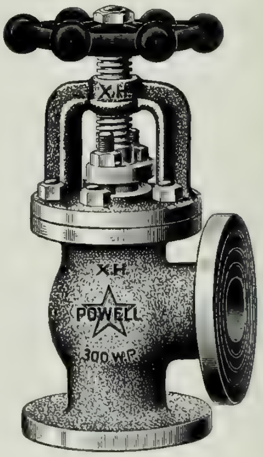

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Pacific Marine Review

The National Magazine of Shipping

March, 1927

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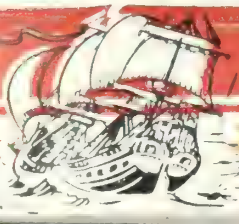

Official Organ
PACIFIC AMERICAN
STEAMSHIP ASSOCIATION

Official Organ
SHIPOWNERS' ASSOCIATION

Pacific Marine Review, Vol. 24, No. 3, Published Monthly at San Francisco. Entered as second class matter at the post office at San Francisco under the act of March 3, 1879. $2.00 a year.

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Pacific Marine Review

CONTENTS

March 1927

Frontispiece ... 19

Editorial ... 109
Two New Jones Bills; World Shipping Conditions; The Accident that Did Not Occur; Can Germany Pay?; Transportation Demonstrates Economy; American Merchant Fleet; Freight Revenues of American Ships; Trade with Australia.

Modern Machinery and American Shipping, by M. B. Lambert ... 112

The Great Lakes-to-Ocean Waterways, by Norman F. Titus ... 113

Map of San Francisco in 1853 ... 116

New Key System Ferryboats ... 117

Pacific Lumber Terminal at New York ... 122

Purchasing for Paper Mills, by D. J. Goldsmith, Secretary, Crown Willamette Paper Company ... 123

The Sewall "Big Four," II, by F. C. Matthews ... 124
The famous four-masted sailing ship Shenandoah.

Why Potato Patch? ... 126

Anchor Bolts for Refractories, by Commander H. R. Hird, U. S. Navy ... 128
Some notes on furnace wall fastenings as developed in the United States Navy.

Voyage on a Motorship ... 131
A lover of the sea and of sailing ships gives his impressions of a trip from London to Capetown on the Union Castle Line motorship Carnarvon Castle.

New York Central No. 34, by J. S. Hines ... 132

Pacific Workboats and Their Power Plants:

- Fishermen Need Larger Terminal Facilities ... 134
- New Atlas Units ... 134
- Workboat Notes ... 135
- Retired Cop Captains Workboat ... 135
- The Winton Engine at Show ... 136

Auxiliaries, Ship Supplies, Marine Equipment:

- Fire Protection for New Tanker ... 137
- Better Lining for Ship Ranges ... 136
- Chevalier Condensation Drainer ... 138
- Corrosion in Tank Steamers, by A. C. Holzapfel ... 139
- The Pedersen Oil Jack ... 139
- Packing ... 139
- Welding and the Welding Rod ... 141
- Thermit Saves Time ... 141
- Marine Uuses for Haskelite and Plymetl ... 148

Barge Canal Buoy Lighting System ... 140

Making Fumigation Pay, by Roy W. Kelly, Industrial Engineer ... 142
Suggestions for getting your money's worth from fumigation.

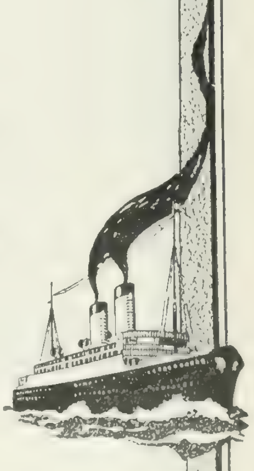
Marine Insurance ... 143

American Shipbuilding ... 149

Directory of Intercoastal, Offshore, and Coastwise Lines Serving Pacific Coast Ports ... 27 Adv. Sec.

Surveys and Gauges of Bulk Oil Shipments ... 53 Adv. Sec.

Of a General Nature:
Fresh Fruit for the Orient, 131; American Engineering Representative, 138; Trade Literature, 138; Isherwood and Bracketless, 145; Page Bros. Freight Report, 147; Bernard Mills, Marine Superintendent, 148; Worthington Pump Buys Harris Air Pump Co., 148.



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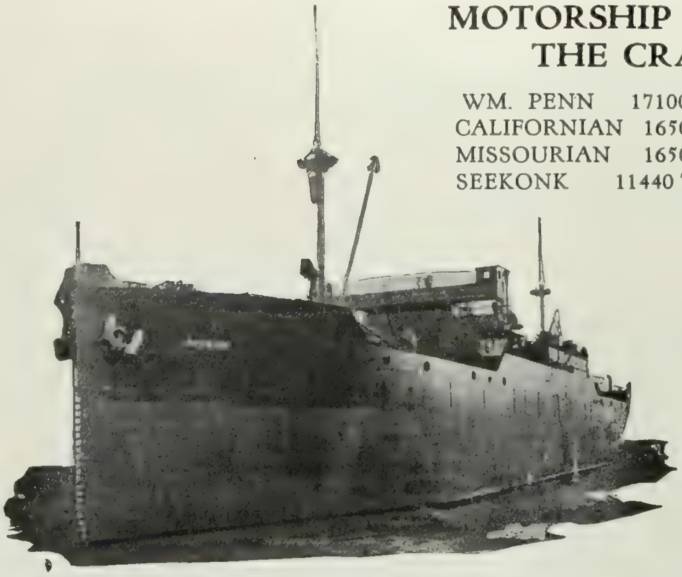

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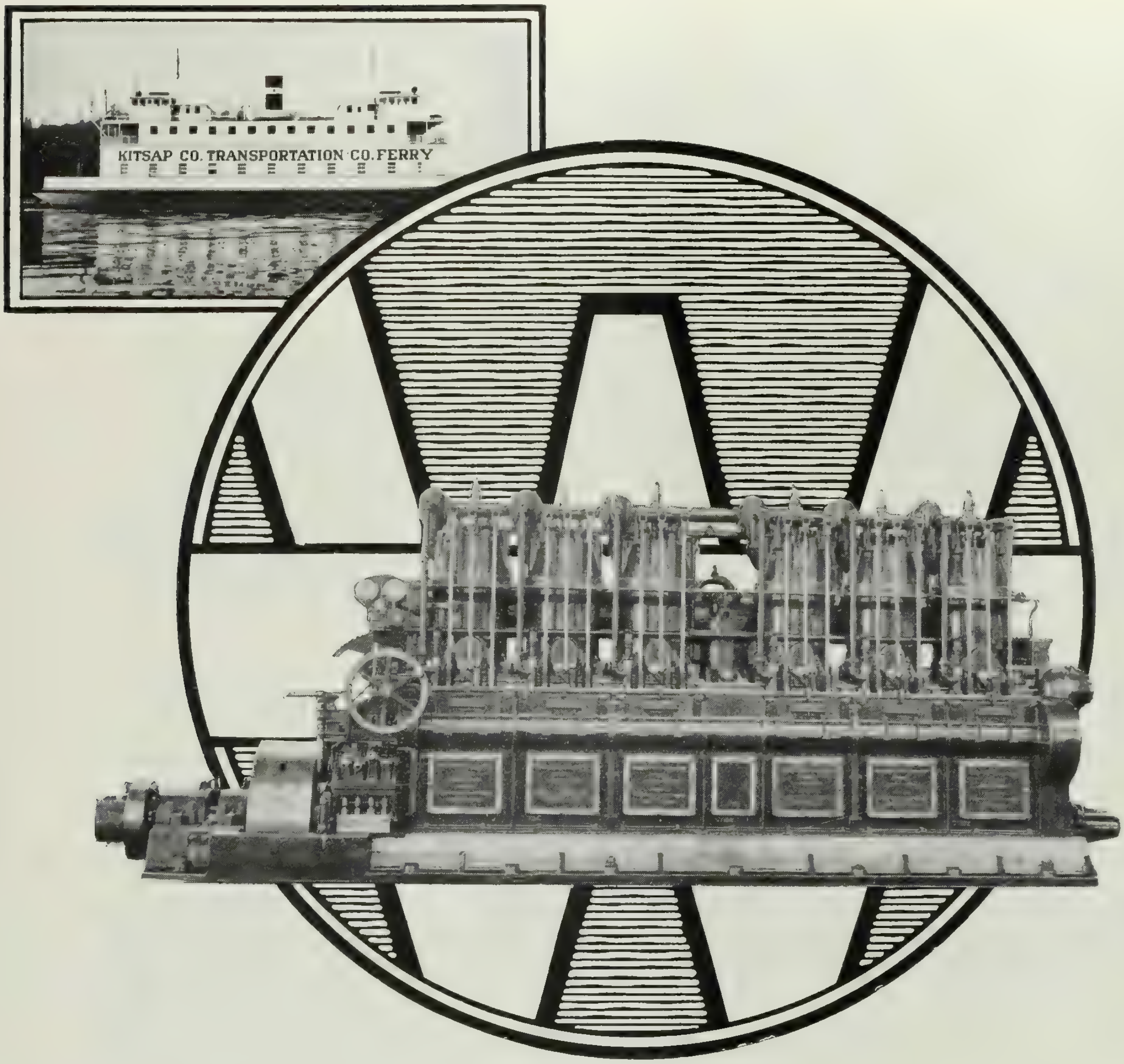

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DIESEL ENGINES

MARCH, 1927

Vol. XXIV. No. 3

Pacific Marine Review

The National Magazine of Shipping

Official Organ
Pacific American Steamship Association

576 Sacramento Street, San Francisco

Member of Pacific Traffic Association

Official Organ
Shipowners' Association of the Pacific

James S. Hines,
President and Publisher.

Bernard N. De Rochie,
Vice-Pres. and Manager.

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Editor.

Paul Faulkner,
Advertising Manager

Two New Jones Bills

THE United States Shipping Board has submitted to Congress two bills, one for the promotion of the American merchant marine under private ownership and the other under government ownership, which bills conform to the conclusions set forth in the report which the Board recently submitted to Congress in response to the so-called Jones Resolution.

Briefly outlined the provisions of the bills are as follows:—

1. Under Public Ownership (S. 5668):—

The Shipping Board is instructed not to sell any vessel or any line of vessels when it believes the merchant marine can best be served by continued ownership and operation of such vessels by the United States, and is authorized to make such repairs, recondition and improve the vessels as to enable them to successfully compete in the foreign trade.

The necessity for replacements and the construction of new vessels of more advanced types is recognized and the Board is directed to make its recommendations in this connection to Congress. Vessels constructed by the Board are not to be sold without the consent of Congress first having been obtained.

2. Private Ownership and Operation (S. 5669):—

The Secretary of the Treasury is authorized to enter into contracts with American citizens owning American vessels engaged as common carriers whereby compensation at rates ranging from $4 per gross ton per year for vessels of less than 10 knots speed to $11 per gross ton per year for vessels making 17 knots. With an additional sum per year equal to 25 cents per gross ton multiplied by the number of knots speed the vessel has in excess of 17 knots, is to be paid for such periods of time as the vessel may engage in trade with foreign ports more than 1000 miles distant from the United States.

In return for this compensation the vessel—

Is to remain under the American Flag for the period of the contract.

Transport all United States mails at the same rate as foreign vessels.

Can be acquired by the government in times of national emergency at its average value during the five year period preceding the commencement of the emergency.

Such contracts may be made for periods up to 20 years and cannot be made to apply to vessels more than 20 years old.

In presenting to Congress these two bills Senator Jones, of Washington, made a masterly statement of the merchant marine situation, in which, while he deplored the necessity of coming to "a next best plan," he doubts the possibility of sufficient encouragement being given private enterprise to maintain and promote a merchant marine and, therefore, in order to see the United States possess a merchant fleet, indicates a readiness to accept the principle of government ownership.

Senator Jones is the Chairman of the Senate Committee on Commerce, high in Republican circles, and an untiring worker for American shipping. His resignation to government ownership of our merchant marine is doubtless attributable to a failure to receive sufficient support in his advocacy of a privately owned one, in which failure we are all to blame as certainly no one can read Senator Jones' speech on the floor of the Senate without feeling that he is fairly putting the issue before the country and that as a people we have been derelict in failing to realize this necessity and make proper provision therefor.

But if, as it seems to be assumed, it is not possible to obtain the aid which is admittedly necessary for the proper growth and sustenance of a privately owned merchant marine, what assurance can be given under the same prevailing circumstances that sufficient interest exists in an American merchant marine to cause Congress to appropriate greater funds in aid and promotion of a government owned merchant marine?

There have been too many subterfuges, too many false starts already for our shipping, and why should we pursue a plan that is admittedly a less desirable one and of doubtful expediency and which is not in accordance with the sentiment of the country as indicated in the regional hearings recently conducted by the Shipping Board?

Under the plan for the promotion of the merchant marine by continued government ownership it will be necessary for the Shipping Board to obtain from Congress annually large appropriations for the operation, repair, reconditioning, improvement, and construction of vessels, to say nothing of administrative expenses. Experience might well lead one to believe that every time such a request is made of Congress it will occasion considerable opposition and unquestionably there will not be granted by Congress, with its general lack of knowledge of shipping affairs, anything approaching what the practical operating experience of the Shipping Board indicates is necessary for the proper maintenance of a government-owned merchant marine.

The attitude of Congress towards shipping in the past has certainly not been such as to lead us to believe it will take a position in the future that will enable the plan for a government-owned merchant marine to succeed. On the other hand, if the United States definitely committed itself under the proposed contracts in the plan for a privately-owned merchant marine, the United States would have to keep faith with the private owners by continuing appropriations necessary to meet the obligations contracted for, and there would at least be a moral obligation to continue the support. Under the government-owned plan will always arise the question of how far the government itself should go into the shipping business and the conflict of opinion will always militate against the success of the plan. This will present a fine field of sport for our competitors who will annually have their chance to issue propaganda against appropriations being made.

[Bulletin National Merchant Marine Association.]

World Shipping Conditions

WE ARE now on a world trade basis normal enough to enable statisticians and trade experts to form an intelligent opinion on future conditions. Normal enough even to allow that a cross section of the opinion of shipping men is a very trustworthy index on which to base expectations.

The upward flurry in ocean freights due to the British coal strike has passed, and rates have settled back to a level about 20 per cent higher than that of a year back, but with a slow downward trend still operative.

The idle tonnage now amounts to somewhat less than 8 per cent of the world's total merchant fleet, the great bulk of this idle tonnage being in the United States and Great Britain. The figure shows a decided improvement over the showing of the last five years. Active scrapping of obsolete and inefficient tonnage, combined with the very small amount of new construction, has accounted for part of this reduction in idle tonnage, but the growth in volume of water-borne commerce has been more largely responsible. On a value basis, international commerce has shown a steady average growth of 10 per cent annually for the past four years. It is said that this represents about 13 per cent gain in volume.

Considering the chaotic conditions that have prevailed in Russia and China and the struggle for rehabilitation in all of Europe, this growth is very remarkable and certainly encourages a very hopeful outlook for the years just ahead.

Certainly the future outlook for world shipping is favorable, the curve of gross earnings is on the ascent, the curve of operating expense is flat or dropping slightly, activity is increasing rapidly.

We of the United States of America, however, are not so favorably affected. We own the bulk of the world's idle and obsolete tonnage. Our shipbuilding and ship operating costs are the highest in the world. Our legislatures play fast and loose with ideas of government operation in foreign trade, government interference in private operation, mail contracts which demand maximum service at minimum compensation, and frequent changes in policy and regulations. This condition makes a long forward look into merchant marine futures impractical from the American viewpoint, so far as the majority of the international trade routes are concerned.

The years ahead are to be good years for the world's merchant marine; good years for the American coastwise and intercoastal merchant marine; good years for the Ameican foreign trader. Whether or not they are to be good years for an American merchant marine in international trade depends largely on Congress.

The Accident that Did Not Occur

WE HAVE records of accidents which have occurred and use them as lessons to prevent the possible occurrence of others, but it is not often that experiences of actual prevention are used as guides. The following account of the actual saving of lives is one of the first to come to our notice.

On one of the San Francisco docks during the first week of February a boss stevedore ran to the port captain's office and reported a dangerous condition in the hold of a ship being unloaded. The port captain, although busy with important executive duties, dropped his office work and took direct charge of the work in the hold. He forced the bosses to watch closely and urged the workers to exert extreme care, in spite of their tendency to minimize the hazard. As a result, the dangerous job was finished without an injury. Although the pile eventually slipped and fell, the workers were able to jump clear when the boss gave the warning call. At least three men would have lost their lives if exceptional precautionary measures had not been enforced.

There are many morals to be drawn from this experience but the principal one of interest to us at this time is that it is often within the power of the bosses to guide their workmen to safety when extra hazardous conditions present themselves.

Your Accident Prevention Department would welcome other reports of similar occurrences. We know that lives are saved every day without the workmen being aware of it.

[Bulletin, Accident Prevention Department.]

Can Germany Pay?

THE National Foreign Trade Council has recently published the results of an investigation by Henry M. Robinson, coframer of the Dawes Plan and president of the First National Bank of Los Angeles. The conclusion reached in this careful analysis of conditions in Germany is that Germany can easily pay since "the reparations burden is probably less—certainly no greater—than Germany sustained in maintaining her own war establishment before 1914."

"It may be that financiers in certain European countries," says Mr. Robinson, "allow the wish to father the thought so far as German economic instability is concerned. But it is rather surprising that bankers and economists in the United States should be expressing opinions to the effect that there must be a revision of the Dawes Plan. The present attitude of Germany's business leaders does not afford any ground for doubt concerning the country's ability to pay."

All that will continue to be required of Germany, according to Mr. Robinson, is that 95 per cent of her present income must support the full 100 per cent of producers while the remaining 5 per cent is applied to reparations. The annual income of Germany, Mr. Robinson points out, is about $14,000,000,000, or more than twenty times the reparations payment, while reduced to workers' hours, a little over two hours per week out of the forty-eight per worker will produce the workers' contribution to the credit in the Reichbank.

Water Transportation Demonstrates Economy

BRIGADIER General Thomas Q. Ashburn, chairman of the Inland Waterways Corporation, a subsidiary of the War Department of the United States, has reported to the Secretary of War that the corporation, through its operations on the Mississippi and Warrior Rivers, transported during 1926 an average of 1000 carloads of sugar per month, which sugar was destined to 20 different States of the Union.

Of this commodity alone there was transported during the year a total of 351,043 tons at rates which compared with what the transportation charges would have been if shipments had moved all rail, effected a saving of $610,198.60.

That this high-grade commodity is being handled successfully by the barge line is shown by the rapid increases in volume of sugar transported during the past four years, as follows: 1923, 131,262 tons; 1924, 150,028 tons; 1925, 213,741 tons; 1926, 351,043 tons.

American Merchant Fleet

MORE American merchant ships were employed in foreign trade on January 1, 1927, than at any other time during the past four years. On that date there were 727 American vessels, of 4,143,619 gross tons, in service carrying cargoes between the United States and foreign countries. In number of vessels employed in foreign commerce this is an increase of 103 over the last quarterly report by the Bureau of Research, United States Shipping Board, dated October 1, 1926, and 163 greater than the number so employed on January 1, 1926.

On January 1, 1927, the privately owned American merchant fleet included 1225 steam and motor driven vessels of 1000 gross tons and over, with an aggregate gross tonnage of 5,924,480 tons, an increase of 10 vessels and 76,700 gross tons over the number and tonnage recorded October 1, 1926. Of this total fleet 379 vessels were employed in foreign trade and 712 in coastwise and intercoastal service, leaving approximately 11 per cent of the fleet unemployed.

On the same date the government owned merchant fleet consisted of 847 vessels of 4,563,000 gross tons. About 42 per cent of this fleet was in active service as against 31 per cent on October 1, this increase being due to the number of Shipping Board boats put into service to relieve congested conditions in the export trade caused by the British coal strike and the diversion to the coal export trade of many vessels normally available for the transportation of other products.

The total American fleet available for foreign, intercoastal, and coastwise trade included, on January 1, 2072 vessels with an aggregate gross tonnage of 10,487,000 tons.

Freight Revenues of American Ships

AMERICAN-FLAG vessels are receiving only about one-third of the freight revenue paid for ocean transportation of cargoes in American foreign trade, according to a special report submitted to the Shipping Board by Philip S. Teller, commissioner in charge of the Board's Bureau of Research.

The report, which is the outgrowth of an exhaustive study undertaken by the Bureau, estimates the total freight cost of our foreign trade during the fiscal year 1925 at $598,896,553.36. Of this, the report states, $198,721,354.60, or about 33 per cent, represents the freight revenue of American vessels.

The report is based on actual transactions during the period considered, and is the first report of its nature ever compiled upon such a basis.

The total amount paid for ocean transportation of dry cargoes during that year was approximately $487,000,000. Freight paid on tanker cargoes aggregated $102,000,000. The freight cost of the Great Lakes foreign commerce was $9,787,000. These three items produce the total quoted above.

Analyzing the earnings of American vessels in their several activities, it develops that they received 59 per cent of the Great Lakes freight, 50 per cent of the tanker freight, and 29 per cent of the dry cargo freight; their total aggregating 33 per cent of the revenues earned by all vessels employed in transporting the foreign trade of the United States.

The domestic water-borne commerce of the United States is restricted by law to American-flag ships. During the fiscal year 1925 they earned $64,248,998 in the intercoastal domestic traffic through the Panama Canal and $55,574,492 in the Great Lakes domestic trade. The addition of these items brings the freight charges paid in 1925 for water transportation in foreign trade and in domestic trade through the Panama Canal and on the Great Lakes to a total of $718,700,000.

Trade with Australia

HUGH GALLAGHER, assistant manager of the Oceanic Line, made a thorough tour of Australia and New Zealand in the late summer of 1926. The following paragraphs are extracted from a speech made by him on December 6 last before the United States Chamber of Commerce at Colorado Springs.

From Captain Cook's romantic discovery on April 19, 1770, has come the Australia we know today. A continent bigger than the United States. A land rich in agriculture and minerals. A land that has over ten thousand years' supply of coal in its known coal beds. A nation of people with high ideals, developing very much as the United States developed in its early youth.

The population of Australia is a little over 6,000,000 people. They are concentrated mainly along the east coast. Sydney, the largest city, has about 1,250,000 people. It is the second largest city in the British Empire and ranks with our two western cities, San Francisco and Los Angeles. The capital, Melbourne, has 880,000 people, and Brisbane, Newcastle, Adelaide, all eastern cities, account for another 750,000. It will be noted that the bulk of the people are concentrated in the cities.

Australia is one of America's best customers. In the year ending 1925, about 180,000,000 dollars' worth of imports came from America. This amounted to over one-fourth of the total imports into Australia. It represents a purchase by every man, woman and child of thirty dollars' worth of American goods.

A visit to Sydney and other large Australian cities is particularly interesting to one engaged in foreign trade. American automobiles can be seen everywhere. A yellow cab meets the steamer. It is the same make as we have in our cities. American goods can be found in all the leading stores, and as a matter of fact they are preferred in a great many cases. True, they cost more than local or imported British articles, but nevertheless, the people seem to find the money to buy them. . . .

On the export side of the ledger, we are not doing our duty by one of our best customers. We imported from Australia only 35,000,000 dollars' worth of their products. This represents only 30 cents per capita purchase of Australian goods as against their purchase of $30 per head. We take only six per cent of Australia's exports. Naturally, some feeling exists on this score, and we cannot blame the Australian for thinking that we should find ways and means to more nearly balance the trade. . . .

The Australian is a great traveler and every year large numbers go back to England. As a rule they take the route through Suez, although a big number travel to Vancouver and thence overland to connect with a steamer for the old country. Many of these people who go back and forth would like to visit America. Many would come this way were they not afraid of our immigration laws. . . .

Had it not been for the world's interest in astronomy, there is no telling how long the Australian continent would have remained a mystery. In 1770, just prior to our War of the Revolution, an expedition commanded by Captain Cook was equipped for a voyage to Tahiti to gather data concerning the passage of the orbit of Venus across the face of the sun. After this event was fully observed, Captain Cook set out towards this unknown land, and his first encounter was New Zealand. He carefully mapped these two islands and set sail to the westward. On April 19, 1770, he encountered the eastern coast of Australia. A landing was made at a suitable place and all were struck with the wonderful richness of the soil. Botanists with the expedition secured many wonderful plants and on returning to England, aroused much interest in this wonderful new land. . . .

The population of Australia is being increased by colonization, and it will not be many years before the number there now will be doubled and trebled. We cannot go on selling to Australia and taking little or nothing in return. The Australian is easy to do business with and is anxious to gain entrance into the American market.

[Reprinted from Aloha.]

Modern Machinery and American Shipping

By M. B. Lambert,

Transportation Sales Manager, Westinghouse Electric & Manufacturing Company

THE rapid development of American industry is attributed to the use of modern power driven machinery. It is estimated that there is approximately 3¾ horsepower per worker in operation in our industrial plants, whereas the average in European countries is approximately 1¾ to 2 horsepower. The widespread use of power driven machinery was made possible by the rapid expansion of electric power distribution.

Many of the modern cargo carrying ships embrace problems in labor saving and other economies similar to that of our varied land industry problems. Shipping, however, has been the last of our basic industries to avail itself to the utmost in the use of modern engineering and machinery.

Shipping is one of the oldest industries; reliability is and always should be the paramount requirement. Land industries may experiment with more efficient machinery which the ship owner does not care to risk, but will adopt it as soon as it is shown that it is reliable and is adaptable to use on ships. Hence we find numerous ships with diesel engine propulsion, diesel-electric, steam turbine, steam geared turbine, and steam electric propulsion as well as auxiliary electric motor drives and other modern electric appliances on new ships and reconditioned ships.

American ocean shipping is confronted with many difficult problems, some of which are economic. The American public has never understood the latter, especially in the interior states. Hence adequate assistance and cooperation have been withheld from the shipping interests in this country, with the result that although we are the greatest industrial nation (thanks to our natural resources, our railroads, and our electric power) our shipping resources do not compare at all favorably with other nations. The development and greater use of modern machinery for propulsion and cargo handling is destined to become a factor in helping to solve this problem.

Ships, as previously mentioned, vary in character similar to land industrial plants. Some lend themselves to efficient diesel-electric drive; others have uses for steam other than propulsion and other factors which make modern higher pressure steam propulsion the most economical. This opportunity for competitive or comparative engineering study and analysis opens the door wide for the application of skilled engineering thought. Competitive effort between the diesel engineer, the steam engineer, and the electrical engineer is bound to bring to the ship owner the same high character of engineering development that the land industries have enjoyed during recent years. It will thus become common knowledge in a few years which type of modern machinery is best for the various classes of shipping.

The shipbuilding industries and the various manufacturers who furnish machinery for shipping could with profit endeavor to coordinate to a greater degree their effort to acquaint the American public regarding the plight of the ocean shipping industry. It was only a decade or so ago that the steam railroads, the national electric light and power industry, and the gas industry were greatly hampered by unfavorable public sentiment and unsound regulation. Ten or twelve years ago the principal topic of the orators at their conventions was that of commiseration about their plight. The addresses and discussions were printed and mailed largely to themselves; very little reached the public for any continued period. Then came a change. Public utility information bureaus were established in many parts of the country with a competent publicity staff in charge, with the result that in a few years the whole attitude of public mind was materially changed, simply because the public in general understood the whole public utility problem better.

Is it possible to do the same thing for shipping? Could the farmer, for example, by this means be shown that the profitable disposal of our surplus agricultural products depends largely on the availability of American shipping to carry it overseas, and that private enterprise is essential to make this successful and enduring?

The Great Lakes-to-Ocean Waterways

Norman F. Titus, Chief, Transportation Division,
Bureau of Foreign & Domestic Commerce

SINCE 1836 the records of our government are replete with a recital of official steps taken in an effort to promote a shipway from the Great Lakes to the Atlantic. Congress after congress has legislated upon the subject, boards and commissions have been appointed to investigate the problem, and, after nearly a hundred years of effort, it begins to appear that ideas are crystallizing and in the near future some definite action may be expected. It is true that to the casual observer, this subject may be regarded as one solely for consideration by the residents of the Great Lakes region, but in reality it is a matter of great national concern and one of peculiar significance to American shipowners.

We now fully recognize the importance of the economic truth that any factor that materially affects the welfare of a part of our country has an important influence upon the balance of it. The economic consequences of the Peace are beginning to force upon our consciousness a realization that this principle has also a world application.

In the mid-continental area of the United States the economic situation is considerably distorted; there is much agricultural distress and incessant demands for remedial legislation. This situation to a large extent has been brought about by transportation changes. Increases in railway rates since the war force the mid-west farmer to pay from 6 to 12 cents more per bushel to reach world markets than before the war. Foreign farmers produce close to ocean ports and pay but little, if any, more than pre-war costs, because shipping rates are substantially at pre-war levels. While it is true that these rate increases apply only on the exports of grain, nevertheless the price which the farmer receives in foreign markets is the principal factor in determining his return upon the whole crop, not alone the export balance. It is this transportation differential that is, unquestionably, one of the most important causes for our present agricultural depression.

Coincident with these increased rail rates, the mid-west has also been affected adversely by the operation of the Panama Canal. Cheapened water transportation has brought the coasts relatively closer together at the same time that increased rail rates, figuratively speaking, have moved the mid-west farther from seaboard. This situation has been expressed graphically by setting up a new measuring unit in the shape of the number of cents that it takes to move a ton of freight. By using this measuring rod, it can be stated, that for a certain manufacturer, these post-war influences have moved Chicago 336 cents away from the Pacific coast, while New York has been moved 224 cents closer to the Pacific coast.

These factors operate reciprocally and not only place a handicap on the outbound products of the mid-west, but also add to the costs of inbound supplies.

All of these influences have had a very far-reaching effect; certain classes of industry have migrated to the seaboard; agriculture has been greatly depressed, and, through the increasing separation of agriculture and manufacture, both have been affected adversely. The net result has been to accentuate one of our present-day evils—the concentration of industry and population in urban communities.

Much study has been given this subject and many people have come to the conclusion that as transportation has brought about this economic distortion, undoubtedly an improvement in transportation would restore the former favorable economic conditions. They have turned to the proposals to construct waterways from the Great Lakes to the Atlantic Ocean as offering the desired remedy. As waterways offer cheaper transportation than rail, they contend that here is the means to give the mid-west farmer and manufacturer cheaper access to the ocean. The Panama Canal cannot be closed; the railroad rates cannot be reduced without impairing disastrously the usefulness of our carriers, but a Great Lakes-to-the-Ocean waterway offers the mid-west a substantial rate advantage which will enable it to compete successfully once more in the markets of the world.

Water Routes

Concerning the waterways, many routes have been suggested and studied but discussion has now concentrated on three routes as being the most practicable. These are as follows:

St. Lawrence Route—This project contemplates improvement of the channel of the St. Lawrence River from Lake Ontario to Montreal so as to permit navigation of the majority of ocean freighters. Such navigation is now practicable from the sea to Montreal.

Lake Ontario-Hudson Route—This project would provide a shipway from Oswego on Lake Ontario to the Hudson River just below Albany. Incidentally, the channel would pass through Lake Oneida, using the lake as a reservoir.

All American Route— This route is exactly the same as the Lake Ontario-Hudson Route except that it includes a proposed canal south of Niagara Falls on American soil, similar to the Welland Canal on the north side of Niagara in Canadian Territory.

The question that now presents itself is—which of these routes is the most practicable and does it offer promise of relief for the mid-west area as claimed? Fortunately this is a matter that has received careful study by competent bodies and their results have already been published. In answering the question that has just been propounded, our main reliance for engineering data is in the reports of the Joint Board of Engineers, appointed by the United States and Canadian governments, concerning the St. Lawrence route, and the Corps of Engineers, United States Army, relative to the Lake Ontario-Hudson and All-American routes; furthermore the economic aspects of these three routes are disclosed in a published report by the Bureau of Foreign and Domestic Commerce. The findings are briefly summarized in the table reproduced herewith.

Channel Depths

The actual channel depths considered by the various engineering boards were: Great Lakes-to-Hudson and All-American route, 22, 27, and 30-foot channel depths; Great Lakes to St. Lawrence, 23, 25, 27, and 30-foot channel depths.

Concerning these various channels, investigation disclosed that the drafts and deadweight tonnage of vessels (excluding combination passenger and cargo ships and tankers) engaged in foreign commerce during October, 1924, entering or clearing at our ocean ports, could be classified as follows:

	ST. LAWRENCE ROUTE		LAKE ONTARIO-HUDSON ROUTE	
Distance from Duluth to:-	Miles	Time	Miles	Time
Liverpool	4,544	17 days -12 hrs.	5,173	20 da - 21 hrs.
New York	3,017	11 " -23 "	1,466	7 " - 11 "
Colon	4,975	19 " - 1 "	3,739	15 " - 17 "
Seattle	9,655	36 " - 6 "	8,419	32 " - 22 "
Gibraltor	5,008	19 " - 4 "	5,180	20 " - 22 "
No. of locks (Lake Ontario to Sea)		7 to 9		18 to 20
No. of bridges " " " "		8		54
Miles of restricted waterways (Lake Ontario to Sea)		21 to 25		128
Maximum new power development (h.p.) about -		5,000,000		negligible
Length of closed season		Practically the same		

Estimate of cost - (25 foot waterway)	Joint with Canada -	Cost all United States
For navigation alone	$173,520,000	$506,000,000
Cost of channel plus development - of 1,365,000 h.p.	350,000,000 to 385,000,000	------------
Cost of channel plus development of 5,000,000 h.p.	620,000,000 to 650,000,000	-------------

(a) A 25-foot channel, available for vessels of 23-foot draft or less, would accommodate about 75 per cent of the entrances and clearances, comprehending over 60 per cent of the deadweight tonnage.

(b) A 27-foot channel, accommodating vessels of 25-foot draft or less, would allow navigation for over 88 per cent of the entrances and clearances, comprehending over 81 per cent of the deadweight tonnage.

(c) A 30-foot channel, for vessels drawing under 28 feet of water, would accommodate 98 per cent of the entrances and clearances, equivalent to 95½ per cent of the deadweight tonnage.

Careful consideration was also given the question of how many American cargo vessels of 1000 tons and over, excluding combination passenger and cargo vessels and tankers, could navigate these various channel depths. The following determinations were made:

(a) A 25-foot channel suitable for vessels of 23-foot draft or less would accommodate 25.2 per cent of American cargo vessels of 1000 tons and over, comprehending 12.79 per cent of the deadweight tonnage.

(b) A 27-foot channel suitable for vessels of 25-foot draft or less would permit navigation of 66.6 per cent of American cargo vessels of 1000 tons and over, comprehending 54 per cent of the deadweight tonnage.

(c) A 30-foot channel suitable for vessels of 28-foot draft or less would allow navigation of 90 per cent of American cargo vessels of 1000 tons and over, comprehending 84.2 per cent of the deadweight tonnage.

All Lake freighters at the present time draw less than 23 feet of water.

Investigation also disclosed that the average size of vessels of all nations engaged in transoceanic trade had increased 33 1/3 per cent since 1914 and that the present tendency is for the construction of vessels of even greater size and speed.

The conclusion is evident, therefore, that in order to assure proper ocean connection the minimum depth of channels should be 27 feet, thus accommodating vessels of 25-foot draft; such craft would include 54 per cent of American cargo vessels and 88 per cent of all our entrances and clearances. It is felt that restricting operation to any less percentage of ocean-going vessels would materially detract from the usefulness of the proposed waterways.

It appears also, that permanent structures, such as locks, should be given a minimum depth of 30 feet, so as to render it possible, by subsequent deepening of canals, to provide for vessels of 28 feet of draft.

The Board of Engineers for Rivers and Harbors, United States Army, on March 23, 1926, reported that they did not feel justified in recommending that the construction of a deeper waterway from the Great Lakes to the Hudson suitable for vessels of a draft of either 20 or 25 feet should be undertaken by the United States at the present time. The board stated that the waterways were feasible from an engineering standpoint, but they did not consider construction justified because, according to their estimates, the annual return in savings of transportation would not exceed by a fair margin the annual costs of operation.

The Joint Board of Engineers on the St. Lawrence Waterway project reported on November 16, 1926, that the scheme was practicable from an engineering standpoint.

For the purposes of this study the reports of the engineers upon problems of construction have been considered final and authoritative. Under these circumstances, the economic factors will be decisive; these factors are the ones mainly considered in this summary.

Savings Due to Waterways

The use of these waterways will bring a result which may be expressed in three ways: first, from the standpoint of the shipper, a saving in freight rates; second, from the standpoint of the public, an expenditure for maintenance, interest, amortization, and operation; and third, from the standpoint of the economist, the actual cost of transportation being vessel cost plus canal cost.

Savings in freight rates.—It is estimated that wheat, the commodity likely to move in the greatest volume and for which it is possible to make a reliable estimate, could be carried from Duluth or Chicago through the proposed St. Lawrence route to Liverpool for 8 to 11.2 cents a bushel, as compared with the cheapest present combination of rates of 17.6 cents, and from the same ports to the same destination through either the Lake Ontario-Hudson route or the All-American route for 9 to 12.9 cents per bushel.

Public expenditure.—The engineering boards have made estimates of the annual charges for interest, amortization, maintenance, and operation; these estimates have been combined with the estimates for potential traffic in order to arrive at the cost to the public for each ton of traffic moved and are shown in the table herewith.

Public Expenditure Per Ton Transported

Route	Interest, amortization, maintenance, and operation	Estimated tonnage	Cost per ton
St. Lawrence	$10,000,000	19,000,000 to 24,000,000	$0.53 to $0.42
Lake Ontario to Hudson	28,770,000	15,000,000 to 20,000,000	1.90 to 1.44
All-American	36,000,000	15,000,000 to 20,000,000	2.39 to 1.78

Concerning the expenditures on the St. Lawrence route, if the cost is divided equally between the United States and Canada, the cost per ton to the United States would be 21 to 27 cents.

Actual cost of transportation; vessel cost plus canal cost.—This factor discloses the effect of distance and retardation on vessel-operating costs through any of the proposed waterways plus the public expenditure to make such waterway facilities available.

For vessel costs, a 7600-ton, deadweight, oil-burning cargo vessel may be taken for illustrative purposes.

The fixed charges and operating costs of such a vessel are approximately $700 per day, or 9.21 cents per ton per day (based on Shipping Board operation as reported.) Two typical voyages illustrating the principles involved are from the Great Lakes to Liverpool and the Great Lakes to Colon. The costs as determined are shown in table reproduced herewith.

Actual Cost of Transportation Per Ton

	St Lawrence Route	Lake Ontario Hudson Route	All American route
Vessel cost (number of days x 9.21 cents, cost per ton per day):			
Lake Erie to Colon	$1.42	$1.11	$1.10
Lake Erie to Liverpool	1.28	1.59	1.58
Fixed charges and operation of canal (based on lowest estimated canal tonnage)	.53	1.90	2.39
Actual transportation cost (vessel cost plus waterway cost):			
Lake Erie to Colon	1.95	3.01	3.49
Lake Erie to Liverpool	1.81	3.49	3.97

Area Affected. All or portions of 18 states undoubtedly will be affected by the proposed waterways. However, for the purposes of this survey, it was assumed that the waterways traffic would originate in the following 12 states: Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, North Dakota, South Dakota, Nebraska, Iowa, Kansas, and Missouri.

This selection is conservative, since it does not include those portions of Montana, Wyoming, Colorado, Oklahoma, Pennsylvania, New York, and other adjacent territory which likely will be affected by the proposed deeper traffic channels.

Some Canadian traffic is included in the estimates of potential tonnage, due to consideration of the present St. Lawrence Canal traffic. It is probable that an additional 2,000,000 tons of Canadian traffic may be available for movement via the proposed St. Lawrence shipway.

Volume of Traffic Now Available. The following estimates of tonnage available to move via the various routes have been determined:

Cargo	St Lawrence Route	Lake Ontario Hudson route	All-American route
Import and export	12,000,000 to 17,000,000	8,000,000 to 13,000,000	8,000,000 to 13,000,000
Domestic (intercoastal and coastwise)	7,000,000	7,000,000	7,000,000
Total	19,000,000 to 24,000,000	15,000,000 to 20,000,000	15,000,000 to 20,000,000

*Tons of 2240 pounds

Unquestionably, considerable local traffic would be stimulated by the Lakes-to-Hudson and All-American waterways. It may be that this local traffic would be of sufficient tonnage to equalize the estimated traffic for the various routes. No attempt has been made to hazard an opinion as to the amount of tonnage which might possibly move via any of the waterways. The estimates of available traffic are based upon the average movement of commodities from 1921 to 1924; they do not attempt to take into consideration the growth of population and industry in the mid-west. If any one of these projects should be consummated, at the time of its completion the traffic requirements unquestionably would be greater than the present needs.

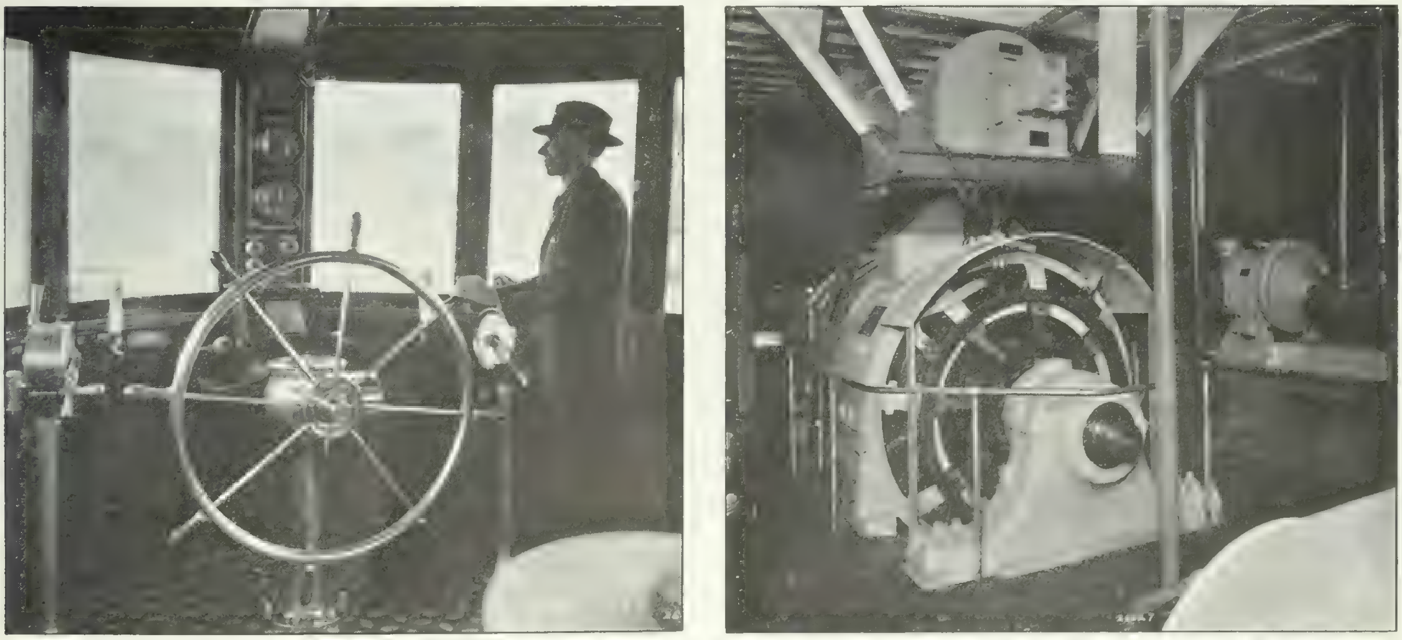
Conclusion

Post-war freight rate increases on wheat in the mid-continental area for the period 1914 to 1926 vary from 7 1/3 to 19 cents a hundred pounds. The summary of the studies of the Great Lakes-to-the-Ocean waterways just outlined discloses estimated savings on wheat of 8 to 14 cents on the Hudson Route and 11 to 16 for the St. Lawrence Route. It is quite clear, therefore, that waterways would offer considerable economic relief to the sorely distressed mid-west.

Further than this, the construction of such waterways would add three thousand miles to our coastline, which, under our laws, is reserved exclusively to American flag vessels for coastwise operation. In addition, there would be stimulated trading from the Great Lakes ports, much to the benefit of our merchant marine.

Clearly, the proposal for a waterway from the Great Lakes-to-the-Ocean is a matter of vital concern to every American shipowner.

An Engineering Parable for American Legislators



The two pictures above show the pilot house and the propulsion motor of a recently built American towboat, the New York Central No. 34. Marine and electrical engineering have here combined to make it possible for even a landlubber, by a twist of the wrist, to maneuver a powerful floating mechanism. America needs some wizard who can, by combining political science and common sense, enable the American merchant marine to be maneuvered into its proper place, in international commerce.

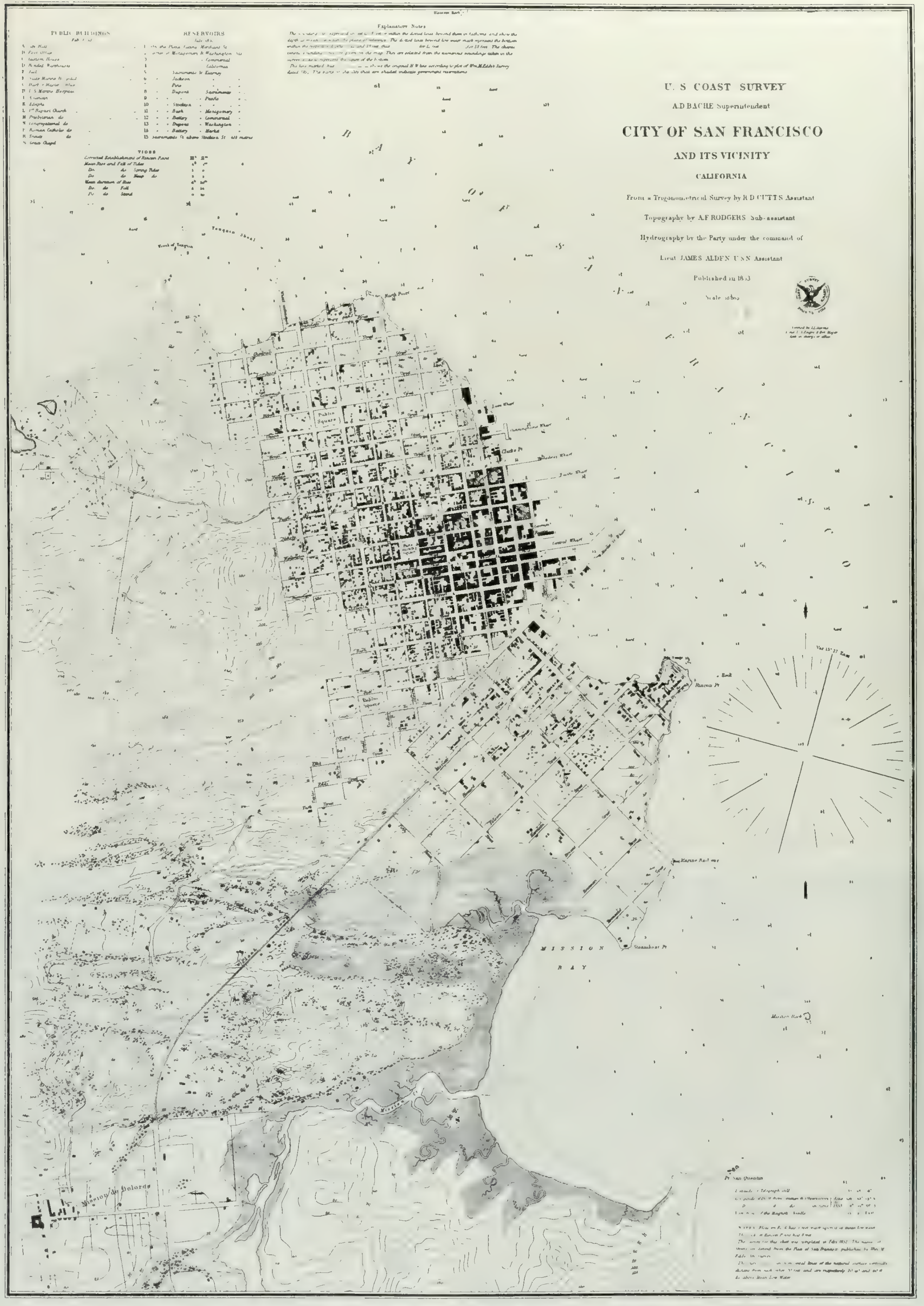
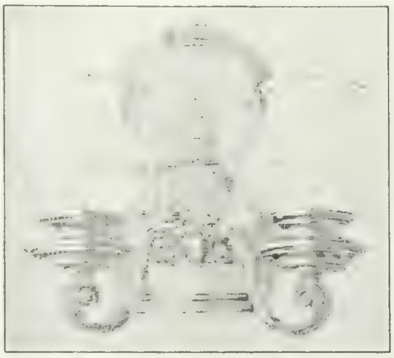


Chart of San Francisco and vicinity in 1853. When this map was made Market Street ended at Fourth Street and San Francisco Bay was ferried by occasional scow schooners. At the present time 150,000 passengers are carried daily on the largest and finest passenger ferryboats in the world.

Transbay Passenger Carriers, Designed by Hibbs, McCauley and Smith, Naval Architects, and Built by The Moore Dry Dock Company, Shipbuilders, Set New Standards for Passenger Ferries

HIBBS, McCauley & Smith, naval architects of San Francisco, and The Moore Dry Dock Company, shipbuilders of Oakland, are certainly to be congratulated upon the design and the production of the new Key System Transit Company ferryboats. The external appearance of the Peralta, as indicated by the photographs reproduced herewith, certainly connotes the epithet "thoroughbred." Every line shows careful consideration of proportion, and the finished result is very pleasing to the eye.


This unique bracket fixture is one of the artistic touches that adds beauty to the passenger accommodations on the Peralta and Yerba Buena.

This impression is so obvious to any observer and is such a delight to the lover of ships that we were not surprised to hear a hard-boiled steam schooner operator almost break out into poetizing over his first inspection and declare that "Exquisite" was the only word in English fit to express his feelings.

On boarding the vessel this impression of sheer beauty of line, aided by faultless craftsmanship, is heightened. The broad spacious decks forward and aft, free of any obstruction, the ample entrance arches, with their bronzed copper doors; the wide, easy, beautifully molded stairways all combine to please and unobtrusively prepare the eye for the vista that confronts it when these great doors are rolled back and the symmetry of line and harmonious blending of color that characterize the exterior are found to an even greater degree in the furnishings, lighting effects, and proportions of upper and main deck passenger accommodations.

All interior finish is in white, with a suggestion of blue stripe on columns and brackets. This, with the warm brown tones of battleship linoleum floors in the main deck cabin and with the blue and white shades of the interlocking rubber tile in the upper deck cabin and the natural teak of seats and trim, presents a very artistic and pleasing contrast which is enhanced by the semi-indirect illumination system. Spacing the two stacks widely apart gives opportunity for a large, beautifully proportioned, cabin dome on the hurricane deck. Of this opportunity, advantage has been taken to the fullest extent, with the result that this room is faultless in line, in lighting, and in harmony. The dome interior is lighted by the cove, indirect lighting system, the light globes themselves being not visible. Stained glass windows featuring marine subjects are placed at intervals in the dome.

Mrs. Lester S. Ready, sponsor, and Mr. Ready, President, Key System Transit Company, at the launching of the Yerba Buena.

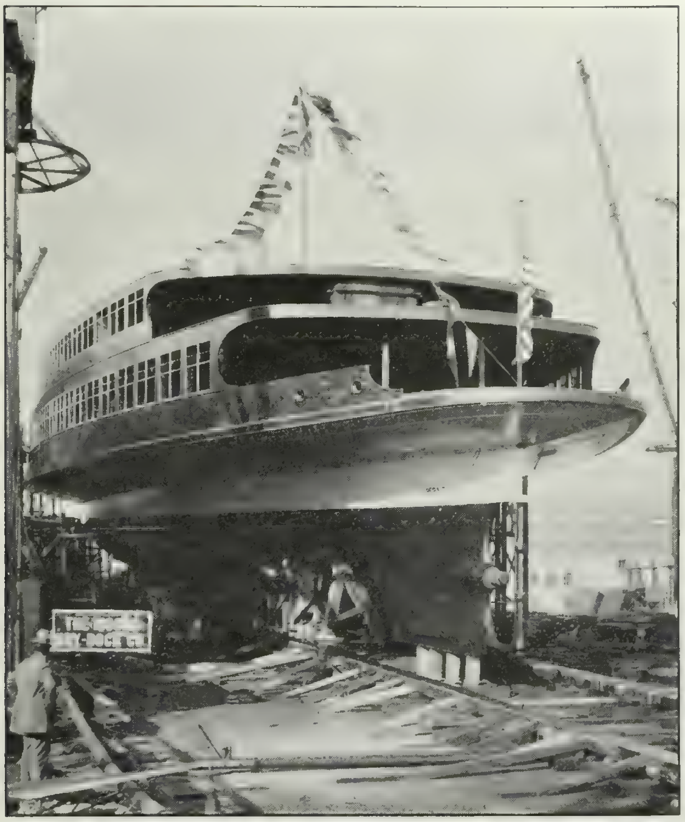
The absence of the usual unsightly bins for the stowage of life preservers is a noteworthy feature. These bins of wood grating construction, with their lanyards and toggles, have always been considered a necessary evil, although detracting from the interior appearance of any ferryboat. On the Peralta, steel trunks constructed underneath the upper deck seats provide stowage of life preservers for the main deck passengers; the bottom of these trunks are formed of Monel Plymetl panels and may easily be opened, thus dropping the preservers to the main deck. For the upper deck passengers, two fore and aft trunks have been built underneath the hurricane deck gangways, port and starboard, and the life preservers for the upper deck passengers are stowed in these trunks, the bottoms of which are also of Monel Plymetl and open downward, dropping the life preservers in the gangway below. Nothing is lost in accessibility or preservation of the life preservers by this method; but a great deal is gained in general appearance.

The large windows of W. P. Fuller plate glass, held in copper gaskets on steel frames supplied by the U. S. Metal Products Company, insure maximum daylight and there is a very noticeable absence of shadow and of glare.

The seating arrangement is attractive and the seats themselves demand attention. The frames of these benches are built of teak. The seat and back are formed to compound curves with a single sheet of Haskelite plywood and are held in place with countersunk brass screws. In designing these benches, several full sized models of varying dimensions and contours were actually constructed, and hundreds of people—short, fat, thin, and tall—sat in them; and the model that received the greatest amount of commendation was the one selected.

Launching of the Peralta. C. O. G. Miller, Mrs. Hermina Peralta Dargie, and Joseph A. Moore

Ventilation and light are



The Peralta ready for launching, showing fine lines of under-water body and handsome appearance of water-tight sponsons.

provided in unusually ample measure. The modern standards of illumination have been utilized, and every occupant of every seat is given an amount of illumination on the page of his book or daily paper that is at least equal to that recommended by the technical research societies. So each passenger will be comfortably seated, in a ventilated spot, with ample light.

The bracket fixtures, as designed and manufactured by Thomas Day Company, San Francisco, incorporate a unique and unusual decorative feature with a marine motif. The plaque forming the base of each fixture is of hammered copper with a sailing ship in relief. This is mounted on a nicely molded teak block, and against the white background of the bulkheads it suggests, along with artistic beauty, a warm geniality.

Another decoration which excites much commendatory statement is the placing of art panels on the port and starboard sides of each fidley and of the engine room hatch casing. Commenting on this feature, Junius Cravens, art critic of the San Francisco "Argonaut," writes as follows:

"An indication of creditable, if exceptional, intelligence on the part of a large corporation is made manifest by the commissioning of Robert B. Howard to paint decorative panels for the main upstairs saloons of two new passenger ferryboats, the Peralta and the Yerba Buena, soon to be put in service on the Key System. We understand that credit for the selection of an artist of standing and ability for this work is due to Captain Edward McCauley, of Hibbs, McCauley and Smith, the naval architects who designed the new boats. It is regrettable that so few men of Captain McCauley's discernment and taste hold influential positions in, or have influence with, San Francisco's important institutions.

Mr. Howard has wisely chosen maps as the subject of the series of paintings. A suggestion of old maps is given by the use of dolphins, sea-serpents, whales and other reputable sea beasts, as well as galleons and various ancient types of ships. The compass dial is also effectively used in places, as well as the small pictorial vignettes so characteristic of old maps.

The maps themselves, though treated decoratively, are geographically accurate. There will be six panels in all in each of the two ferries. The saloon of each boat will contain a general key map of the Bay region and a map showing the Key System itself. The remaining four panels for the Peralta are the counties of the Bay district, while the additional four panels for the Yerba Buena are maps of the Bay cities. All the maps are decoratively handled and are warm and rich in color. They will be an adornment to the new ferryboats of which the Key System may well be proud."

No discussion of the comfort features of the boat would be complete without reference to the restaurant. The Key Route restaurant service has always been very popular, and in the new boats the facilities for increased service will be noticed. Located on the main deck, outboard, amidships, it is well lighted and ventilated; sanitary to the highest degree; comfortable; of inviting appearance; and designed so as to serve quickly the large number of commuters who enjoy their meals during the running time of the passage. Many details are the result of the experience of the commissary department of the owners, whose experience with the "eating commuter" has been so mutually satisfactory.

Special attention has been given to the designing of the galley equipment and seatings and tables for the restaurant. The chairs, especially designed for these ferryboats, were built by the F. H. Harder Manufacturing Company of San Francisco. The galley will be completely equipped with electrical cooking devices for short order service. This equipment was largely supplied by the Fred S. Campbell Company of San Francisco. All tables will be topped with a single slab of specially molded Sani-onyx in pure white supplied by the Sani Products Company of Chicago. The floor of the restaurant and galley is covered with attractive tile. Main deck cabin floor is laid with Armstrong battleship linoleum, supplied and installed by the Van Fleet Freear Company of San Francisco. Exposed parts of the main deck are covered with Duraflex, supplied and installed by Gunn Carle & Company of San Fran-

Length over all	276′0″
Length between rudder posts	256′0″
Length between perpendiculars	256′0″
Breadth over guards	70′0″
Breadth molded at sponsons	47′0″
Depth of hold	18′4″
Depth molded	21′0″
Sponson overhang	11′6″
Normal light displacement	1754 tons
Normal light draft—keel	13′7½″
Normal load displacement	2015 tons
Normal load draft—keel	14′9½″
Deadweight capacity	261 tons
Passenger capacity	4000
Seats	2340
Normal S. H. P.	2250
Maximum S. H. P.	2600
Speed (Normal S. H. P. (Normal light displacement	14.5 knots
Speed (Maximum S. H. P. (Normal light displacement	15 knots
Propeller Revolutions (Normal S. H. P. (Normal light displacement	200
Capacity—fuel oil	228 tons
Capacity—fresh water	153 tons
Capacity—stores	13 tons
Normal fuel oil—⅔	152 tons
Normal fresh water—⅔	102 tons
Normal stores—⅔	[illegible]
Capacity trimming tanks—each	[illegible]

Principal characteristics of Key System Ferries Peralta and Yerba Buena.

Broadside view of the passenger ferryboat Peralta on builders trials on San Francisco Bay.

cisco. The inter-locking rubber tiling on the upper deck was supplied and installed by the New York Belting and Packing Company, San Francisco branch. The paint for interior finish was supplied by the W. P. Fuller & Company of San Francisco.

The men's toilet room on the main deck, outboard, is equipped with the very finest of Crane quality plumbing fixtures. Hot and cold fresh water is available at all lavatories. Flushing action of all toilets is insured by the installation of Victory self-cleaning flush valves. The lavatory for women is located on the upper deck and, in addition to the usual conveniences, there is installed a beautifully furnished, separate lounging or rest room with large glass windows overlooking the water and furnished with tables and upholstered chairs and couches. Ice water for drinking fountains and for the restaurant and refrigeration for galley and pantry food storage are provided by two automatic Frigidaire refrigeration machines supplied by the Delco Light Co., San Francisco. Fresh water is handled on the Kewanee automatic pressure system supplied by the Simonds Machinery Company of San Francisco.

Below the main deck, as one enters the main power station amidships, the eye is again pleased with the symmetry of arrangement and the beauty of color scheme. All the interior above the waterline is white. All piping is white. All valves, all ladders, all gratings, and all trim on machines are black. All rails are bright brass. All the castings, frames and main castings of machinery are a bright blue. The result is an engine room that has a most unusually pleasing appearance and gives the impression of a machinery display in an exhibition. The same color schemes prevail in the two boiler rooms and in the two motor rooms. While this unusual color combination makes a very attractive picture of these five spaces, it is very obvious that strength and rigidity of structure and ruggedness of machinery have been amply stressed in the design.

Quartering view of the Peralta on trial trip.

Characteristics of Hull

The characteristics of the hull in which this power is housed and into which all this beauty and grace are built were determined after careful calculations checked by and partially based on model experiments. As built, they follow the figures shown in the table reproduced herewith.

Safety Features

Freedom from fire hazard is provided by the use of steel as the construction material for essential members. Hull, bulkheads, bulwarks, and decks are of steel. Wood appears only in the teak seats for the passengers and in the teak pilot houses. Sheathing, where provided, is of approved fire resistant material. Fire extinguishing appliances are provided to comply fully with the requirements of the law and of the classification societies.

Fuel tanks, built integrally in the hull, are subdivided so as to be located opposite the fire rooms. There are two fire rooms separated from each other by the engine room. Fuel tank groups are separated from each other by fresh water tanks and the usual coffer dams.

The hull is divided by six main athwartship watertight bulkheads into seven main water-tight compartments. These compartments are, respectively, No. 1 ballast tank, No. 1 motor room, No. 1 fire room, engine room, No. 2 fire room, No. 2 motor room, No. 2 ballast tank. There are also two longitudinal wing watertight bulkheads extending from No. 1 motor room to No. 2 motor room, and between these bulkheads and the skin of the ship are located the fresh water tanks and the fuel oil tanks. Thus located, the tanks furnish a double hull along the major portion of the boat's length on each side. Inasmuch as the hazard of collision is far greater than that of stranding, this double hull adds greatly to the security of boat and passengers.

In addition to the underwater hull subdivision, the

View of the ferryboat Yerba Buena at the outfitting dock of The Moore Dry Dock Company

design calls for another feature that will contribute greatly to the safety of the passenger. This feature consists in supporting the overhung main deck by water-tight plating rather than by a row of stanchions. A water-tight sponson extending around the entire main deck is thus formed, whose sole function is to provide a reserve of buoyancy. The buoyancy thus provided is sufficient to float the ship even though the entire underwater hull spaces were flooded. Incidentally, the sponsoned boat has a better appearance than the stanchioned boat—a result in this particular case that is of secondary importance. All of these underwater enclosed spaces are protected against corrosion by a thorough coating of Wailes Dove-Hermiston bitumastic.

Safe navigation is largely a matter of the personal equation. However, the arrangement of range lights, fog lamps, and Sperry searchlights on steel tripod masts above the hurricane deck and aft of the pilot houses gives an excellent arrangement for maximum visibility, and the complete control of the power plant and of either or both rudders from either pilot house affords maximum maneuvering capacity. The steering gear is an important advance step for ferry design. Each rudder is operated by a Hyde electro-hydraulic steering gear controlled by electric telemotor from either pilot house. Thus there is a complete spare steering gear, and for maneuvering both rudders can be used independently if desirable.

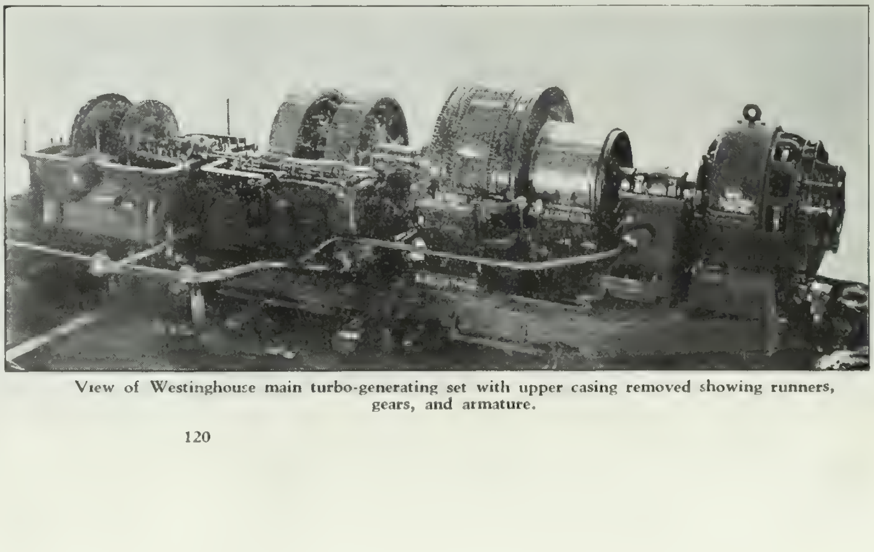
According to careful calculations, the stability of the boat—its ability to maintain an upright position—under the worst conditions of loading is ample. On recent tests by the U. S. Steamboat Inspection Service, the Peralta was found to answer, with a considerable margin to spare, all of the very rigid requirements of that service for passenger ferryboats. Four thousand life preservers of the U. S. inspected jacket type are carried on each boat. These were manufactured by L. Mundet & Son, Inc., of Brooklyn and supplied through C. V. Lane of the firm of Ford and Geirrine, San Francisco. Life boats are carried on the hurricane deck and are handled by Steward davits.

Power Plant

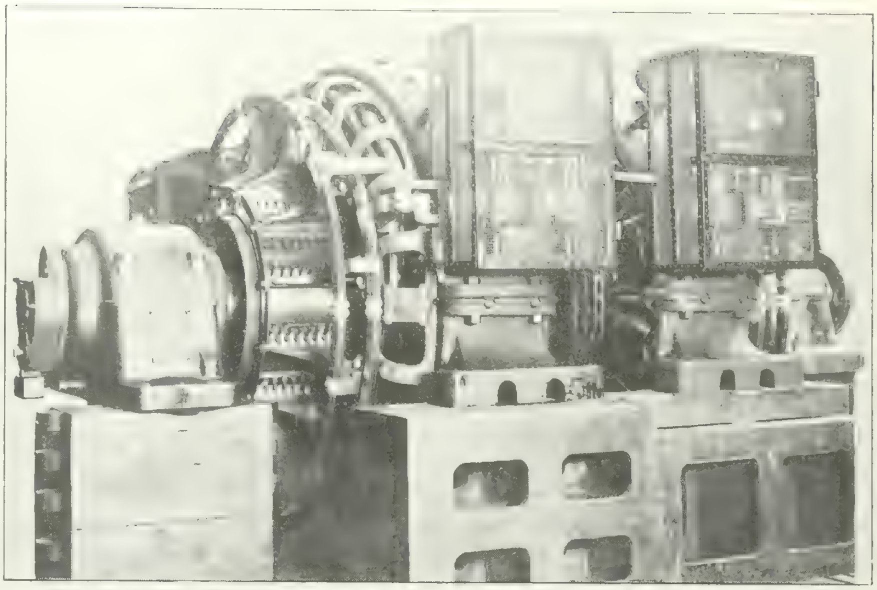
The power plant on these boats approximates a well designed central station ashore. Four Babcock & Wilcox water-tube boilers, arranged in pairs in two separate boiler rooms, provide steam at 250 pounds throttle pressure and 100 degrees superheat to a Westinghouse-Parsons turbine of a normal rating of 3010 brake horsepower and a maximum duty rating 3430 horsepower. This turbine operates at 3600 revolutions per minute, driving, through single reduction gearing, a Westinghouse direct current generator and exciter at 514 revolutions per minute. The generator in this set is rated at 1900 kilowatts normal output and 2150 kilowatts maximum output, and the exciter is of 200 kilowatts normal output.

The turbo-generating set is mounted on top of its condenser with all of the condenser and part of the base of the turbine gear case and generator below the level of the operating platform. This arrangement gives a clear open platform all around the main unit, and an observer is immediately impressed with the compactness of this turbine, due, of course, to the high speed. The height of this operating platform also makes possible an ideal location for the 200 kilowatt Westinghouse auxiliary generating set, enabling that set to qualify under United States Steamboat Inspection rules as an emergency lighting set. Under all ordinary circumstances, the exciter on the main generating set is of sufficient capacity to take care of the lighting load, the auxiliaries, the ordinary power load in addition to the excitation of generator and motor fields. Ventilation of the engine and boiler and motor rooms is assured by Wing-Scrimplex vertical shaft ventilating fans.

The central power plant supplies current to the two double unit Westinghouse marine propulsion motors, which drive the forward and after screws independently and differentially, the speed of the motors being controlled from either of three control stations, one in each pilot house and one in the engine room. This control is on the Ward-Leonard system and gives to the pilot complete and differential control of direction and speed of either or both propellers. The propelling motors each have a normal rating of 2250 horsepower



View of Westinghouse main turbo-generating set with upper casing removed showing runners, gears, and armature.



Propulsion motor, Westinghouse double unit type, on test block at East Pittsburgh Works.

and a maximum duty rating of 2600 horsepower, driving the propeller at 200 to 215 revolutions per minute. Propeller thrust is taken on Kingsbury thrust bearings and the propeller shaft bearing is of the McNab-Vickers patent type.

A Sharples lubricating oil centrifuge insures pure lubricating oil for the turbines and gears. All auxiliary machinery throughout the vessel will be driven by Westinghouse motors, and the various pumps will be supplied by the Worthington Pump & Machinery Corporation.

As will be noted in the table of characteristics, the Peralta is fast. On builder's trial an average of several high speed runs shows 15.24 knots, or nearly 18 miles an hour, giving her ample reserve of power and speed over service requirements.

A number of auxiliaries in addition to those already mentioned contribute to the successful functioning of the steam generating and steam using units on the Peralta.

The feed water heaters were built and installed by The Moore Dry Dock Company to their own design. Fuel oil heaters are of the Reilly type, built and supplied by the Griscom-Russell Company. Steam coils are installed also in the fuel oil tanks. The steam lines to the fuel oil heaters and the fuel oil tanks coils are protected against condensate by that unique San Francisco production, the Chevalier condensation drainer. Four of these devices are installed in this connection on each ferry and another takes care of the steam line to the galley.

Engine room telegraphs and loud speaking telephones, supplied by Chas. Cory and Son, Inc., insure communication between pilot houses and engine room control stand whenever it is desirable or necessary to change from direct to indirect pilot house control. The Howard Clock Company of Boston supplied the electric clock installation, insuring uniform and correct time indication in all parts of the vessels.

Bassler meters, supplied by the American Liquid Meter Company of Alhambra, California, guarantee correct measurement of fuel oil and a positive check on fuel consumption.

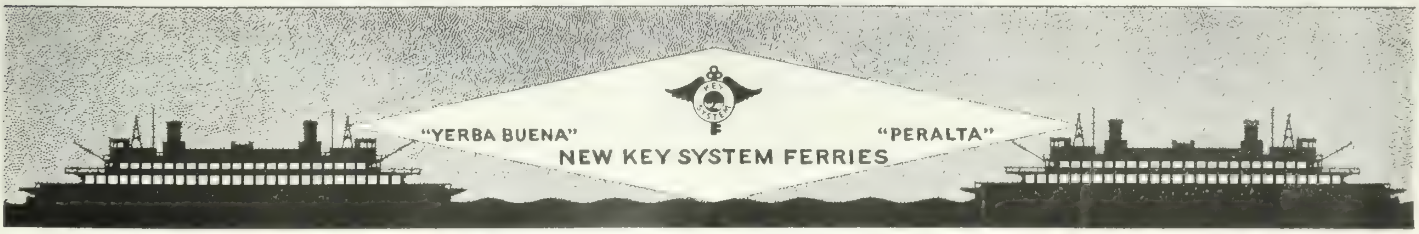
Byers iron pipe, Lunkenheimer valves, and 85 per cent Magnesia pipe covering form a good combination for the transmission of energy in the form of dry superheated steam. Sil-O-Cel lagging protects the main deck in way of boilers and uptakes.

Hickman air separators supplied by the Western Engineering Company of San Francisco protect the condenser tubing against corrosion due to entrained air.

Four Sturtevant No. 4 multi-vane blowers, each driven by a 5-horsepower, direct-connected Westinghouse motor, assist the draft on the four boilers.

Structural ship steel for the hulls of the Peralta and Yerba Buena was furnished by the Bethlehem Steel Company. The bottom and boot top paint is Federal, manufacturered by the Federal Paint and Composition Company.

The Peralta will be delivered on March 15, 1927, and the Yerba Buena some few weeks later.

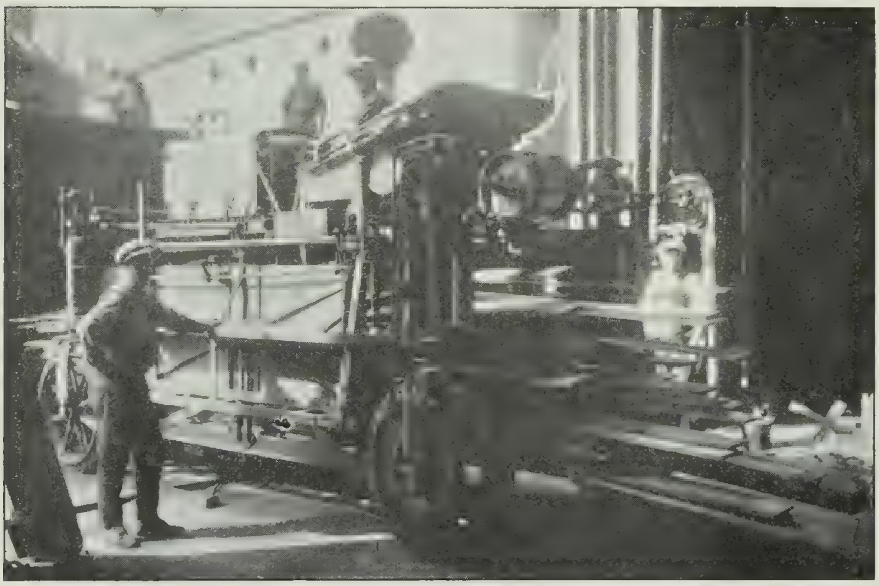


Pacific Lumber Terminal at New York

THE Columbia Pacific Shipping Company at Portland, Oregon, agents, brokers, and owners of steamships, finding that their lumber ships on the intercoastal steamship lines were badly in need of facilities at the metropolitan district of New York for handling their lumber, during 1926 secured a vacant tract of land facing on East River with proper pier facilities located in the heart of the Greenpoint district of Brooklyn.

This property is composed of 2½ acres on the north of the India Street lumber pier and 2¾ acres on the south side of this pier at the foot of India Street.

General view of the India Street Terminal.



Ross carrier picking up lumber at ship's side, India Street Terminal.

K. D. Dawson, vice-president and general manager of the Columbia Pacific Shipping Company, having secured possession of this property, organized the India Street Lumber Terminal, Inc. for the development on the property of a modern lumber terminal. Concrete runways and roads were installed and many improvements made in the pier to insure prompt and efficient discharge of lumber from the vessels. Ross lumber carriers were placed in operation on the property to move lumber from ship's tackle to delivery yard, and improvements have been installed in the way of loading machinery, facilities for back-piling, and every device necessary for the most economical handling of lumber. A fleet of motor trucks takes care of the delivery of lumber from this territory to outlying territory in Brooklyn and Greater Manhattan.

This terminal is located directly across the East River from the New York 23rd Street docks and is said to be the only property available at an advantageous location in the metropolitan district.

The India Street Lumber Terminal, Inc. is used by the Arrow and the Quaker Lines' eastbound intercoastal services, and it is now possible, through this terminal, for the lumber shippers to quote on business laid down in retail yards on Long Island and Manhattan on the basis of rates quoted by the Arrow Line and Quaker Line and the India Street Lumber Terminal, Inc.

COURSE IN MARINE INSURANCE

The University of California Extension Division will offer a course in Advanced Marine Insurance, by James A. Quinby, beginning Wednesday, March 16, 6:30 p.m., 234 Pacific Building, San Francisco.

APOLOGIA

In the February issue of Pacific Marine Review two credit items were overlooked which we are now glad to supply.

On page 95 the picture of the British freighter City of Norwich ashore on Long Island, opposite the home of Elmer E. Sperry, should have been credited to International Service.

On page 68, the two pictures showing scenes on Puget Sound should have been credited to Harold Locke, photographer of Everett, Washington.

Ross carriers spotting lumber in delivery yard.

Purchasing For Paper Mills

By D. J. Goldsmith, Secretary, Crown Willamette Paper Company

THE main business and executive offices of the Crown Willamette Paper Company are at San Francisco. An executive operating and engineering office is located at Portland, Oregon. Manufacturing, converting, and logging activities are carried on at Camas and Cathlamet, Washington; West Linn, Oregon City, and Lebanon, Oregon; Floriston, Truckee, and Los Angeles, California. At Camas and West Linn hotels for employes are maintained, and at Floriston a hotel and a general store.

Formerly operating units sent requisitions to one of the central offices, San Francisco or Portland, for their requirements of materials and supplies. The central offices negotiated the purchase and the mill's requisition was then rewritten on a purchase order form. Invoices were received and checked at the central offices and then passed on to the mills, where they were checked again. This duplication is now avoided by a new system which provides for both the issuing of orders and the handling of invoices directly by the mills.

Under this system purchasing men are stationed at Portland, Camas, Cathlamet, West Linn, Lebanon, Floriston, and San Francisco. At Camas, West Linn, and San Francisco they are supported by assistants. At each plant the mill store is part and parcel of the purchasing department.

The purchasing agent at Portland is the key man for northern plants. In addition to exercising general control and supervision, one of his principal functions is to keep each of the northern purchasing departments informed of current prices in the Portland market. A regular system of price sheets has been worked out by which Portland advises the mills of local price changes as they occur. This man keeps in close touch with the market and each mill's requirements and is thereby able to guide the purchasing in the most advantageous channels. It may be added here that, so far as conditions permit, requirements of the mills for miscellaneous items of hardware, plumbing, electrical, and general mill supplies are combined in one monthly order.

The medium of authority and control is the Purchasing Manual. This is a loose leaf information book, fully indexed, uniform in all purchasing offices, the pages of which are written and issued as required from time to time solely by the officer in charge of purchasing at San Francisco. The manual contains a complete outline of the purchasing system and policy, together with instructions, rules, and regulations. There is a separate sheet for each item pulp and paper mills ordinarily have occasion to purchase, naming firms on whom orders are to be placed, terms and expiration dates of contracts, and all other information necessary for completely and properly writing the purchase order. The purchasing manual correlates the work of all of the purchasing departments, establishes and maintains uniform office methods, tending towards unity of thought and action.

In the manual purchases fall in one of two groups.

a. Those which mill purchasing departments order direct.

b. Those which mill purchasing departments refer to San Francisco or Portland for further attention.

In either event the mill writes an order, not a requisition. Pulp and paper mill purchasing may be segregated as follows: raw materials; equipment; supplies, including pulp and paper mill specialties and general factory, shop, and mill supplies.

Raw materials are covered by term contracts negotiated at San Francisco. For such items sources of supply and prices become fixed for a definite period. By means of a manual sheet the several offices are informed of these contracts, enabling the mills to order directly as shipments are required.

Equipment is next on the list. Here the executive operating and engineering departments are interested. Much would be lost if the engineers simply wrote up specifications and turned them over to the purchasing department. Our system provides for those of the engineering and operating departments to have direct contact with the engineers and sales people of the concerns interested in bidding on equipment, these departments working together with the purchasing department in a spirit of mutual helpfulness to accomplish the most for the company without interference by departmental prerogatives.

Supplies falling in the classification of pulp and paper mills specialties are to a considerable extent provided for by definite arrangements entered into by the San Francisco office covering a period of time—the mills being informed the same as in the case of contracts. General factory, shop, and mill supplies, consisting of an unlimitable list, can for the most part be purchased to best advantage in the local markets adjacent to the mills. Items such as incandescent lamps, packing, and many others are covered by yearly contracts or purchasing arrangement.

Copies of all purchase orders, issued by the mills, copies of their correspondence, and copies of bills and vouchers are forwarded to San Francisco for checking and review.

The system has three objects in view, which we are pleased to say are being accomplished: (a) Centralized control and supervision without duplication of work; (b) Delegation of authority for action on the part of local purchasing staffs; and (c) Scope for engineering and operating men to participate in the purchase of equipment.

In conclusion the following purchasing code has been written into our manual in order that everyone connected with the department may have before his view the same guiding principles and ideals.

Buying is science.

Profits are "saved" by wise buying.

Spending money judiciously is a harder task than the acquisition of it.

There is no surer way of losing money than buying on price alone.

Pay the lowest price for the quality purchased and get the highest quality for the price paid.

Have the right goods, in the right quantity, in the right place, at the right time, and accomplish this with the smallest outlay of money consistent with good business practice.

Get the most for the company's purchasing dollar.

Purchasing contemplates proper use and conservation of materials as well as the actual purchasing of them.

The Sewall "Big Four", II.

The Famous Four Masted Sailing Ship Shenandoah

By F. C. Matthews

Shenandoah in a gale off Cape Horn.

THE day before Thanksgiving Day 1890 was a gala day at Bath, the center of shipbuilding in the state where "they pry up the sun every morning." Some eight thousand people gathered to witness the launch of the largest sailing ship in point of capacity that had been constructed in the United States up to that time. The ship was the Shenandoah, the fourth four-masted square rigger to be built in this country, her predecessors being Great Republic, Ocean King, and Frederick Billings.

Shenandoah was launched from the same stocks on which the Rappahannock had been built and was some 200 tons larger than the latter through having four more frames in the midship section. Her tonnage was 3406 gross, 3258 net, and dimensions 299:7 by 49:1 by 28:6. She was very strongly built, 800 tons of hardwood being used in the frame and about one and one half million feet of Georgia pine in the ceilings, planking, etc. She was metaled to 25 feet with 5165 sheets, the placing of which required 3000 pounds of nails. The spars of fore, main and mizzen masts were nearly identical in size, the lower wasts being 89 feet long, 38 inches in diameter. Topmasts were 56 feet long, and topgallant, royal, and skysail masts, 69 feet. The lower yards were 92 feet long, 22 inches in diameter at the slings. The lower topsail yards were 84 feet long and upper topsail yards 76 feet. Top gallant yards were 66 feet, royals 56, skysail yards 46 feet. The spanker or jigger mast was 96 feet long, 26 inches in diameter, and its topmast 82 feet long. The steel spike bowsprit was 30 inches in diameter and 43 feet outboard. Two of her anchors weighed 6800 and 6400 pounds. Her cost was reported to have been about $175,000.

The command of the Shenandoah was given to Capt. James F. Murphy, popularly known as "Jim" Murphy, a genial gentleman and an able navigator who had been master of the ship W. F. Babcock, also built and owned by the Messrs. Sewall. On December 16, 1890, she reached New York from Bath and was put on the berth for San Francisco. She took her departure January 19, 1891, her crew, in addition to the captain, being three mates, a carpenter who also acted as donkeyman, a boatswain, cook, steward, cabin boy, four apprentices and 24 A.B's., nearly all being American citizens.

The Shenandoah arrived at San Francisco May 25, a passage of 126 days; had crossed the equator in the Pacific 91 days out but the final 15 days were of calms and light head winds close to the coast; made land off Monterey May 21. She was soon chartered to load wheat for Havre and left port August 1 with 5628 short tons aboard. On proceeding down the bay bound to sea, the whistle of her donkey engine continually tooted a farewell to the tugs and steamers at the docks, all of which in their shrill way were shrieking "bon voyage" to the largest of American sailing ships and her gallant captain. She made the run from San Francisco to Havre in 109 days and then crossed to New York in 37 days.

During the remainder of her career as a merchant ship, the Shenandoah was employed mainly in trade with San Francisco. In 1892 her passage from New York to the Golden Gate was 111 days; in 1893 it was 152 days; and in 1896 145 days. From Liverpool she made two passages to San Francisco, 118 days in 1894 and 116 days (113 days from Tuskar) in 1895. From Baltimore she made four passages; 163 days in 1897 (continuous light and variable winds); 131 days in 1898; 150 days in 1904 (much head winds); 273 days in 1907 (via Melbourne, 83 days).

From San Francisco the Shenandoah went to Liverpool on five occasions, her runs being 116, 111, 114, 102, and 113 days. To New York she had five passages also; 108, 118, 124, 126, and 166 days (75 days from Valparaiso where she had put in leaky and was a month undergoing repairs).

In 1901 she was 139 days from New York to Japan, said to have been the fastest time over that course for the previous ten years, she beating the new ships Acme and Brilliant by over two months and one month respectively. Captain E. A. Watts, formerly in the bark Pactolus, was in command, and after discharging her oil cargo she crossed from Yokohama to San Francisco in ballast in 34 days, her best day's run being 313 miles. In 1906 she was 131 days from Puget Sound to New York.

In 1897 Captain William H. Dunphy, well known in connection with his command the ship Occidental, had the Shenandoah for one round voyage, being succeeded by Captain Starkey. In 1899, Wilder Murphy, son of Captain Jim Murphy, who had been mate under his father, succeeded Captain Starkey. He was then just over his majority, and as the youngest captain in the American mercantile marine his previous successful career was largely exploited in the public press. However the results of his voyage from Puget Sound to Australia, thence to San Francisco, were so unsatisfactory that after arrival at the latter port in January 1890 he was superceded by his mate, Harvey. Young Murphy then went as mate on the John McDonald which was lost with all hands in 1901, supposedly burned off the California coast while bound to San Francisco from Baltimore.

Captain Harvey took the Shenandoah from San Francisco to Sydney, sailing March 16, 1900, with one and one half million feet of lumber. The passage was made in 50 days. Captain Harvey was ill on leaving Sydney on the return voyage and soon after sailing became mentally deranged. On the night of the fourth day out, he evaded the vigilance of mate Taylor and, while the ship was going before the wind in a heavy sea, jumped overboard and was drowned. The ship reached San Francisco October 20, 1900, 63 days from Sydney and then went to Liverpool.

While the two fastest passages made by the Shenandoah from Eastern ports to San Francisco were her 111 days from New York and 116 days from Liverpool, she has on different voyages covered the various sections of the run in spaces of time which total only 102 days. In 1894 she was 26 days from New York to the line and 9 days only rounding the Horn; in 1891 she was 22 days from the line in the Atlantic to the Horn; in 1892 she had only 19 days from the Horn to the Pacific equatorial crossing; and in 1895, 26 days from the line to San Francisco.

Eastbound from San Francisco the Shenandoah has some good work to her credit. Passing through the Golden Gate December 17, 1893, she crossed the line 15 days out and passed Cape Horn on the 42nd day; on the 50th day out she was north of the River Plate, but thereafter met with adverse winds and weather clear to Liverpool, which she reached April 7, 1894, 111 days out. In 1896, leaving San Francisco December 2, she was in latitude 7 north when only 10 days out; then had 5 days of calms; crossed the line on the 18th day out; passed Cape Horn 44 days out; thence 28 days to the line with very light trades; and 30 days thence to Liverpool. This passage of 102 days is her fastest eastward run. The famous British clipper ship Miltiades sailed from San Francisco December 29, 1896, and although it was first reported that she arrived at London on March 23, 1897, which would be 84 days and the record for fast passage, it transpired that such report was incorrect and that she did not actually reach London until May 25th, thus being beaten 45 days by the Shenandoah.

On her passage from New York to San Francisco in 1892 the Shenandoah was in a race with the ships S. D. Carleton, Captain Amsbury, and the Tam O'Shanter, Captain Peabody. The Shenandoah had just completed her voyage from San Francisco to Havre in 109 days, thence 37 days to New York. The Carleton had been 112 days from San Francisco to Havre, thence 33 days to Philadelphia, while Tam O'Shanter had been 122 days San Francisco to Havre, thence 18 days to Baltimore. Shenandoah left New York March 24; Carleton loaded at Philadelphia and took her departure from Delaware Breakwater April 3; Tam O'Shanter, from Baltimore, left the Chesapeake March 25. The Carleton was the favorite at San Francisco and Philadelphia, the Shenandoah at New York, and the O'Shanter at Baltimore. Bets aggregating a considerable amount were placed on the respective ships, one of which was $3000 on Shenandoah to beat Carleton, with the "Tam" barred.

On July 13, the "Tam" passed through the Golden Gate, 110 days out, followed by the Shenandoah two hours later in 111 days. The Carleton did not show up until August 23, 142 days passage. She had beaten both her competitors to the line but in latitude 44 South Captain Amsbury had for four days the heaviest weather he had met with during his 26 years at sea. His ship was driven 500 miles to leeward, his competitors in the meantime having quite favorable weather, and each made the Cape Horn Passage in 13 days. After passing the Cape the "Tam" was leading the Shenandoah 2 days but the latter gained 3 days in the South Pacific, this being later offset by the "Tam" gaining two days in the North Pacific and so winning the race.

Off Cape St. John these two ships had been within easy signalling distance, and as the breeze, which was needed, at last developed, the "Tam" getting it first sent up the signal flags which read "adoo." Captain Murphy afterwards said that he did not mind the spelling nor the message until he reached port and found that his rival had preceded him.

The Carleton was 34 days from latitude 44 South, Atlantic, until getting clear of the Cape and her poor run of luck continued in the Pacific. She found variables from west-northwest to easterly instead of southeast trades and had but a short spell of northeast trades. She was 26 days from 50 South to the line and 32 days thence to port. Completing these voyages all three ships loaded at San Francisco for Eastern ports and the Carleton retrieved herself by making the run to New York in 108 days against Tam O'Shanter's 118 days to the same port and Shenandoah's 116 days to Liverpool.

A letter from Captain Murphy to friends in San Francisco recounts his "race" with the ocean greyhound New York three days before his arrival at Liverpool in April 1894. The Captain wrote, "April 3 was in company racing with the American steamship New York for 40 minutes during which time she came from in sight astern to out of sight ahead."

An instance showing that the race is not always to the swift occurred in 1895. According to the memorandum of the British clipper ship Cutty Sark, Captain Woodget, from Australia for London, this incident happened: "January 25; 56:12 South; 72:44 West; coming up to a large four masted bark and to my surprise the signal was run up "What ship is that?" a rather unusual thing for an American ship to do, but she wondered who it could be that was overhauling her. The four master proved to be the Shenandoah, 'Frisco for Liverpool." As a sequel it may be stated that the famous Cutty Sark arrived at London March 26, 86 days from Brisbane and on the same day the Shenandoah reached Liverpool, 114 days from San Francisco. On her outward passage on this voyage, the Shenandoah was on June 22 and 23, 1894, off Staten Land, in company with the Jabez Howes also from New York and the British ship Pegasus from Liverpool. The Howes reached San Francisco September 28, followed next day by Pegasus, but Shenandoah did not arrive until October 8.

On her voyage from Baltimore to San Francisco in 1898 the Shenandoah had a most exciting experience off Cape Horn. Very bad weather prevailed, with great quantities of ice and icebergs. Blocks, sails, and ropes were frozen stiff and the main rail belaying pins and ropes were one solid mass of ice. A meteor came sailing through the heavens, a great green ball with a long trail of fire behind, and for a time Captain Starkey feared it would strike the ship which, he said, "would have meant another vessel being posted at Lloyds as missing. It sailed over our head, however, and exploded before striking the water some distance away. We saw the fragments as they scattered but did not hear any sound. It was a most beautiful, although a most fearsome sight. The sea was lit up with a green glare and as it came nearer and nearer, it looked to our scared eyes the size of a house. We all expected to hear a great noise when it went off but were disappointed. The scattering fragments struck the water with a hissing sound, so had there been an explosion, I think we would have heard it."

On March 29, 1897, the Shenandoah sailed from Baltimore for San Francisco with a cargo of coal for the Mare Island Navy Yard. When well down in the South Atlantic she sprung a leak in a heavy gale. Rather than chance the passage of the Horn, Captain Chapman stood for the Cape of Good Hope and on August 5 put into Melbourne for repairs. These being completed she sailed October 5 and reached San Francisco December 27. On entering port she had a close call from destruction. Her towboat, the Liberty, was not powerful enough in the breeze blowing and when this freshened the ship bumped on the Potato Patch, off the North Head, Golden Gate, striking six or seven times. Two powerful tugs were secured and on getting into the bay she was found to have six feet of water in the hold and to be making four inches per hour.

From December 1907 until January 1910 the Shenandoah was laid up in San Francisco Bay. She was then extensively overhauled, after which she loaded 1120 tons of scrap iron, 2000 tons of asphalt, and 300,000 feet of lumber. She left San Francisco February 16, 1910 and arrived at New York June 24. She was then sold to the Scully's for $36,000 and was converted into a coal barge, her hailing port becoming Perth Amboy. Shorn of her tall masts and spars, her sailing days were ended and she started to earn her future livelihood with the very matter-of-fact assistance at all times of a steam tug. On October 16, 1910 she completed her first experience as a barge by arriving at Providence. Her name appears in registers until 1917 but not thereafter.

Why Potato Patch?

JUST outside the entrance to San Francisco Bay is a shoal spot which for many years has been known as the "Potato Patch." How this name became attached to this particular section was the subject of inquiry by a Pacific Marine Review reader lately, and one of the staff was detailed to find the origin of it. Many of the old timers were interviewed and the reasons for the name were varied. Some of them seemed apt enough, but in most cases there was a lack of coordination with the name and facts.

For instance, one marine man was sure that it was because a scow schooner, potato laden from the delta section, had drifted out there and sunk, and her potato cargo breaking out and covering the sea had given rise to the name. It was pointed out, though, that the place had the name Potato Patch years before potatoes were grown in the Delta region.

Another shoreside seafarer was sure the name originated in the early days when a sailing vessel was approaching the heads. The lookout aloft saw the surface of the water over the shoals covered with white foam, streaked with the muddy colored water flowing out from the Sacramento River. From his point of view it reminded him of a New England last summer's potato field on a frosty winter morning. So he hailed the deck, shouting, "There's something off the port bow that looks like a potato patch." This conjecture is equally at variance with truth, for in those days the sailor lookout who would violate sea ethics by giving voice to his own opinions as to what a thing looked like would be in for an interview with the mate when he returned to the deck.

Still another ancient mariner put forward the idea that the plotting of the four fathom curve on the old charts looked very much like the outline of a Burbank potato. He was right as to the appearance, for on the chart of 1859, reproduced herewith, the outline of the four fathom curve most decidedly look like the Solanum tuberosum.

A ship steward of olden days was certain that the name came from the habit of stewards on incoming steamers of throwing overboard excess supplies of potatoes, as their vessels neared port. Of course, they kept the "spuds" until harbor was in sight, dumping them on the bar, and the vegetables, floating, gave rise to the name. This tale, like that of the wreck of the delta schooner, will not hold water, for the very simple reason that raw "spuds" refuse to float.

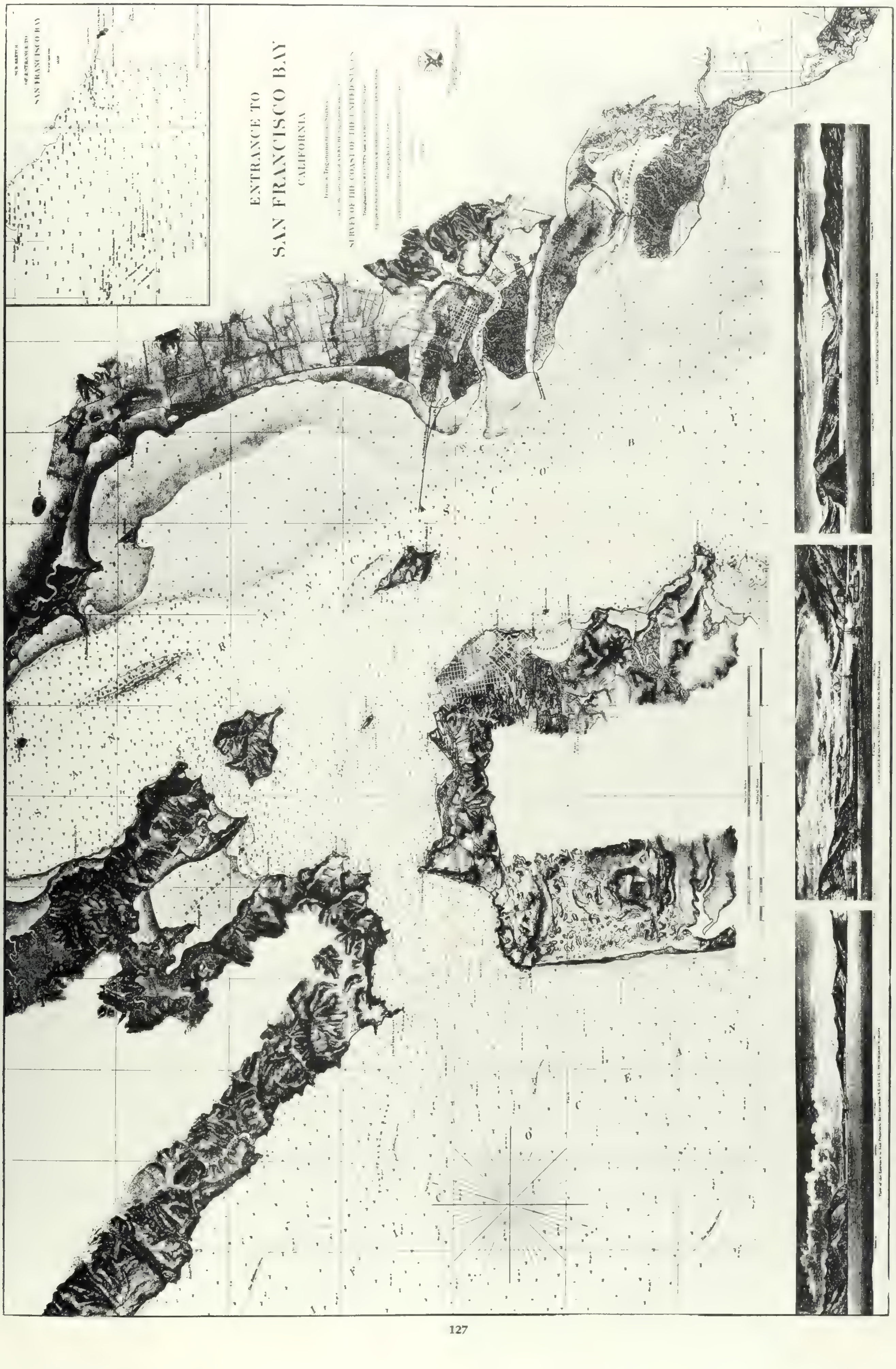
Tug boat men who for years have operated out over the bar and thousands of times passed close to the "Potato Patch," were all equally in the dark as to the origin of the name. However, it was suggested by one of these gentlemen that the United States Coast and Geodetic Survey office be called on as an authority on coastwise nomenclature. The idea seemed a good one and was acted upon.

Captain Whitney's force of assistants delved into the records, and in the Pacific Coast Pilot, fourth edition, completely revised and rewritten in 1889 by the late Professor George Davidson, at that time assistant superintendent, was found the following passage regarding the shoal

". . . . locally this bank is known as the 'Potatoe Patch,' which name is said to originate from the fact that the small schooners coming from Bodega and Ballenas Bays frequently lost part of their deck loads while crossing it."

This would seem to be the best solution for the puzzle, yet it will be noted that Professor Davidson writes, "is said to originate." If any reader of Pacific Marine Review knows a better and more trustworthy reason for this name we would be very thankful to have it sent in for publication.

It might well be noted in the quotation from the Pacific Coast Pilot that the name of one of the bays is spelled "Ballenas," meaning, in Spanish, whales, and is so spelled on the old charts, though modern writers and cartographers write it Bolinas. And again note that "potatoe" is the way of spelling the common designation of Ireland's staff of life on the old charts and descriptions, though the final "e" is omitted in late editions of Webster.


ENTRANCE TO
SAN FRANCISCO BAY
CALIFORNIA
SURVEY OF THE COAST OF THE UNITED STATES
SKETCH OF ENTRANCE TO SAN FRANCISCO BAY
SAN FRANCISCO BAY
PACIFIC OCEAN

Reproduced from an old U.S. Coast Survey chart made in 1859. Note the appearance of the Four Fathom Curve just outside the Golden Gate. Note areas then covered by San Francisco, Oakland, and Alameda.

Anchor Bolts for Refractories

Some Notes on Furnace Wall Fastenings as Developed in the United States Navy

By Commander H. B. Hird, U. S. Navy

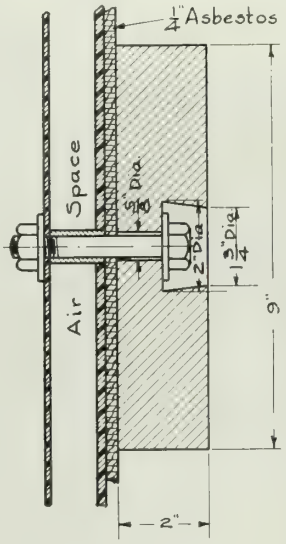


Figure 1

THE use of oil as a fuel in naval vessels about 1910 introduced new problems in furnace design, one of the most difficult ones being furnace refractory linings and insulation.

The higher temperatures obtained in the oil fired boilers required the development of better refractory brick. This part of the problem became more difficult because of the fact that very large changes in furnace temperatures had to be provided for and also because of the possibility of maintaining high furnace temperatures for prolonged periods by the use of oil.

Anchoring of the refractory brick also became a more important and difficult problem in oil fired furnaces not only because of the higher temperatures, but also because of the large areas of furnace linings which were subjected to "panting," which in the early days of oil burning was not at all an uncommon condition at high rates of combustion.

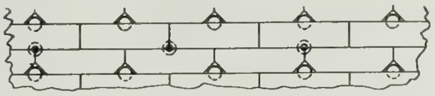
The first refractory brick used was a special brick about 9 by 9 by 2. Each brick was held in place by one anchor bolt as shown in Fig. 1. The head of the bolt fitted into a formed recess on the fire side of the brick. After building the walls, these recesses or holes were filled up with a plastic cement or fire clay to protect the head of the bolt from direct contact with the furnace temperature. It was, of course, very difficult, if not impossible, to plug up these holes with a suitable material that would not shrink away from the brick or break up and fall out due to the changes in temperature. As a result the heads of the bolts were continually burning off, and after any sort of steaming it was usually necessary to do considerable rebricking, or at least to replace many of the anchor bolts, large supplies of which were always carried on board.

It was not long, of course, until both the form of brick and the method of anchoring were changed. The next brick used was of a commercial size—that is 9 by 4½ by 2½—and was anchored as shown in Fig. 2.

With the brick anchored as shown there was still considerable difficulty experienced with the anchor bolts and an attempt was made to cool the anchor bolts by beveling the corners of the brick below the anchor bolts, as shown in Fig. 2. At the back of this space formed by the beveled edges of two adjacent bricks a small hole was drilled through the casing so that air from the fireroom could enter the furnace below the bolt and thus cool it. It is needless to say that this method was soon abandoned. Various other attempts were made to air cool the anchor bolts by hollow shanks, radiating fins, etc., but without success.

In order to reduce weights to a minimum, particularly on the lighter, higher speed ships, both efficiency and comfort were sacrificed and it was customary to insulate oil furnaces by one course of refractory brick 4½ inches thick, back of which and inside the furnace casing was usually placed ¼ inch or ½ inch of asbestos mill board. With practically no insulation back of the brick the temperature gradient through the brick was of course quite steep, and the anchor bolt heads being protected by two and one-half or three inches of the refractory were not exposed to the extremely high temperatures of the furnace. It was therefore not very difficult to find a material that would produce fairly satisfactory results. At least an anchor bolt material could be found that would have the same life as the bricks.

Inasmuch as strength of the material was not a requirement (the strength of the refractory being the limiting factor in this connection) it was necessary only to find a material that would not oxidize or become too brittle at the temperature to which it must be subjected. Many materials were tested and taking into consideration costs, ease of manufacture, and



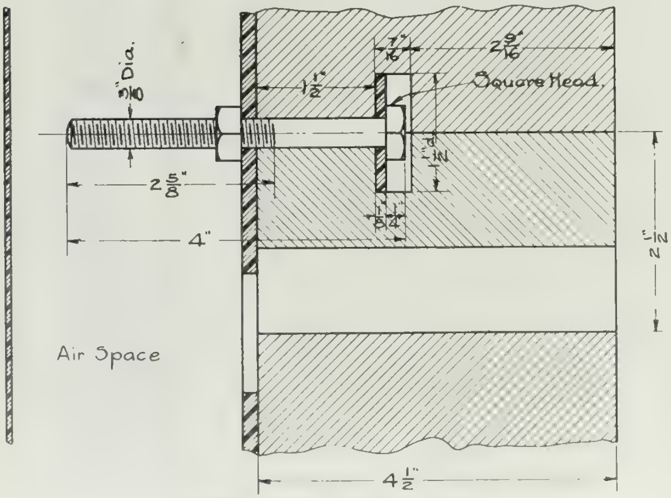
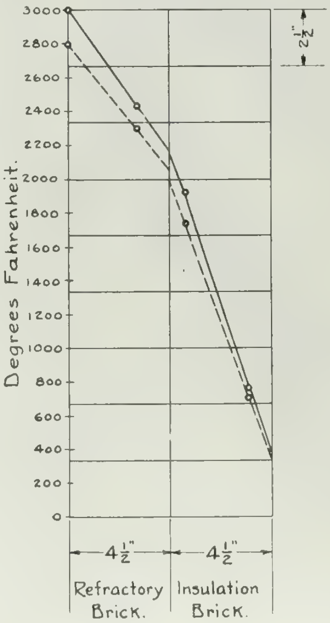


Fig. II. above. Fig. III. at right.



performance, anchor bolts of monel metal either cast or rolled were found to be the most satisfactory.

Plugged holes similar to those used in the earlier brick and described above were of course abandoned and every effort was made to keep the bolt head as far away from the furnace face as possible and to protect it as much as possible by the refractory. The type of brick which was used quite successfully and adopted as a standard was similar to that shown in Fig. 2 except that the corners were not beveled.

In naval vessels, oil is burned by what is known as the mechanical atomization method and the closed fire room system of forced draft is used. When a fire room is being operated at fairly high rates, a considerable amount of air is forced through the fire room and into the furnaces. As a result, the temperature of the fire room is quite reasonable. At low powers and while at anchor, however, such is not the case and unless the forced draft blowers are operated at capacities higher than actually necessary to furnish the air required for combustion, temperatures in the fire room where the furnaces are poorly insulated become excessive. The result is that the fire room personnel operate the blowers at higher capacities than necessary to keep the temperatures down. This of course is a very uneconomical practice.

In order to provide more comfortable conditions for operating personnel and to increase fire room efficiency by decreasing furnace radiation and to reduce somewhat the tendency of personnel to operate the large forced draft blowers at excessive speeds, more recent practice, in practically all types of ships, has been to provide considerably more insulation. The present specifications now require a 4½-inch refractory wall back of which is a 4½-inch insulating wall of calcined diatomaceous earth brick.

This increased insulation makes the anchor bolt problem quite a different one. The temperature gradient through the refractory brick is no longer so steep and the head of the anchor bolt which is embedded in the refractory is now subjected to very high temperatures.

When destroyer furnaces were first insulated in the above manner it was realized that the anchor bolts would be subjected to much more severe temperatures and that the monel bolts, then used as standard, were not entirely satisfactory. However, at that time a suitable material had not been found and the first few installations were made with monel bolts.

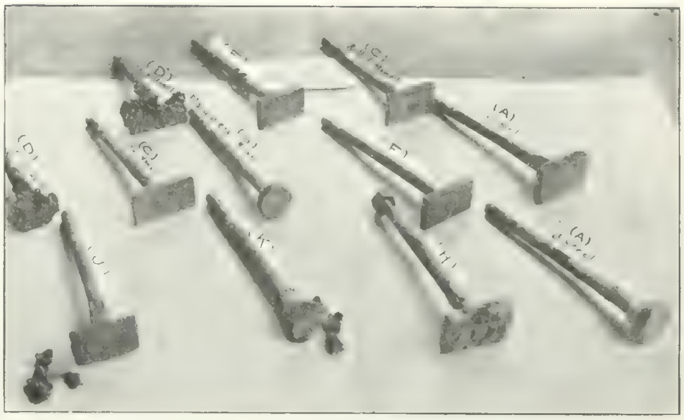


Fig. IV.

Results were even worse than had been expected. After only short periods of high power steaming the furnace walls began falling down, due to failure of the anchor bolts. In the meantime, tests of many different kinds of materials were being made at the Fuel Oil Testing Plant at the Philadelphia Navy Yard, in order to obtain an anchor bolt which would withstand the necessary high temperatures and which could be manufactured at a reasonable price. Bolts made from these materials were actually installed in a furnace and subjected to furnace temperatures ranging from about 2800 degrees to 3000 degrees Fahrenheit for periods of 24 to 30 hours. The actual temperatures at the bolt heads ranged from 2200 degrees to 2550 degrees Fahrenheit. Fig. 3 represents the approximate temperature gradient through refractory and insulating walls with the above furnace temperatures.

Some of the materials tested and the results of the tests are as follows:

A. Class "B" steel. This material fused at low temperatures. The fused metal cut deeply into the brick and actually carried down the furnace brick work in places.

B. Class "B" steel specially treated to prevent oxidization at high temperature. This material was not appreciably better than the untreated material.

C. Rolled Monel. This did not fuse but oxidized excessively. The bolt "puffed up" and became very brittle.

D. Cast Monel. In some cases this appeared slightly better than the rolled monel but in other cases not so good. This difference in performance was undoubtedly due to the differences in foundry practice in casting the metal.

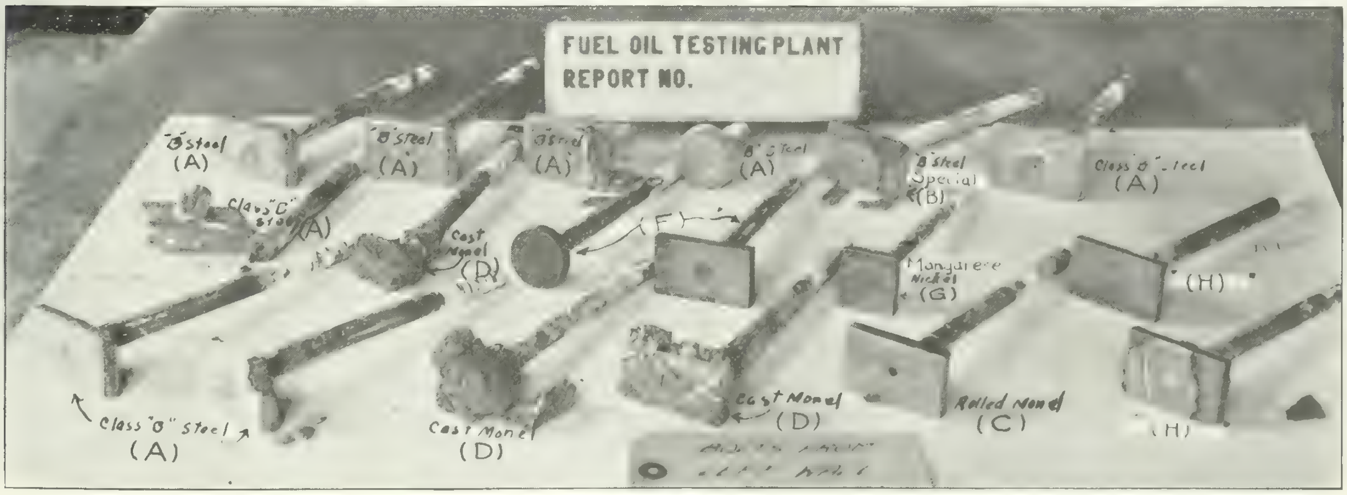
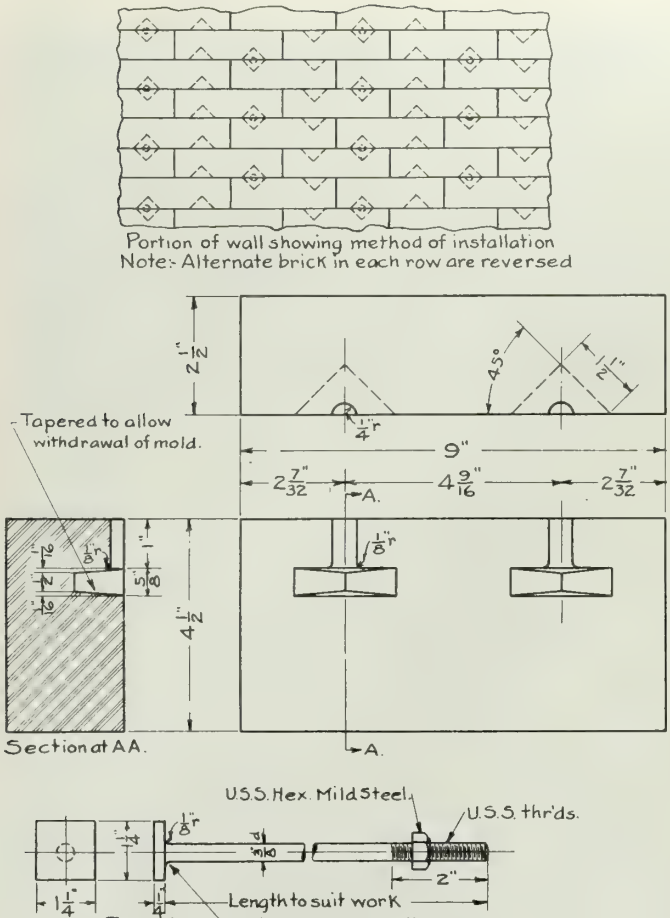


Fig. V.



Forged or Cast Manganese Nickel.
Manganese about 4 per cent, nickel remainder

Fig. VI.

E. Special alloy of following approximate chemical composition:

Nickel	35 to 36	per cent
Chromium	3 to 3.5	"
Manganese	2	"
Copper	remainder	

The performance of this material was very similar to that of the rolled monel.

F. Special alloy of the following approximate chemical composition:

Nickel	72.8	per cent
Chromium	19.8	"
Iron	3.6	"
Manganese	2.2	"
Copper	1.6	"

This material performed very satisfactorily. It oxidized only slightly and retained its strength.

G. Manganese-nickel, approximately 96 per cent nickel and 4 per cent manganese. This material was very satisfactory. In test it became coated with a very thin film of manganese oxide and was very tough after test.

H. Special alloy of following approximate chemical composition:

Chromium	16.50 to 18.50	per cent
Iron	81.60 to 82.50	"
Manganese	.30 to .50	"
Silicon	.50 to 1.25	"
Carbon, under	.10	"
Sulphur	.04	"
Phosphorus	.04	"

Performance very similar to that of Class "B" steel.

I. Special alloy containing 27 to 30 per cent chromium, the balance iron with small amounts sulphur, silicon, manganese, and phosphorus.

This material oxidized only slightly but became very brittle.

J. Special alloy of following chemical composition:

Chromium	12 to 16.	per cent
Iron (approx.)	85.	"
Manganese	.50	"
Silicon	.50	"
Carbon, under	.12	"
Sulphur	.025	"
Phosphorus	.025	"

Performance very similar to "I." Bolts of this material became very brittle under the head.

K. Special alloy. Chemical composition:

Chromium	20.	per cent
Iron	78 to 79.	"
Copper	1.	"
Carbon (approx.)	.30	"

Oxidized heavily, and performed in general very similar to Class "B" steel.

Of the above materials only "F" and "G" were considered as satisfactory for use in naval furnaces. The special alloy "F" due to its excessive cost was discarded in favor of "G," the manganese-nickel (4 per cent manganese). Subsequent tests were made of a manganese-nickel bolt containing about 5 per cent manganese. This material proved to be equally satisfactory as the 4 per cent manganese. The accompanying photographs (Figures 4 and 5) show the condition of bolts of some of the above materials upon completion of the tests.

As a result of the above tests a standard manganese-nickel (about 4 per cent manganese) anchor bolt, as shown in Fig. 6, has been adopted for use in the furnaces of Naval boilers. This sketch also shows the standard fire brick and the method of anchoring. Both the bolt and the method of anchoring have proved to be quite satisfactory in actual service in naval vessels.

In connection with the manufacture of manganese-nickel anchor bolts, the following comments on both the cast and forged bolt, may be of interest.

Cast bolts, that is the finished bolts, should conform to the following chemical analysis:

Nickel, min	93.0	per cent
Manganese	3.50 to 5.	"
Iron, Max.	2.0	"
Silicon, max.	.50	"
Carbon	.05 to .30	"
Sulphur, max.	.035	"

Bolts having the minimum impurities will bend through 180 degrees without fracture, while those having the maximum impurities permitted will bend through 90 degrees, which is considered satisfactory.

In order to produce uniformly successful results, "reverts" should be kept low, not more than 25 per cent.

Various methods of foundry practices were used when the manganese-nickel bolts were first considered. It soon developed however that better bolts could be manufactured at less cost by forging. Most navy yards forge the bolts from 3/8-inch stock, upsetting the heads in three steps. One yard is at present experimenting with 5/8-inch stock, forging the shank to 3/8-inch and upsetting the head in two steps. A sufficient number of bolts have not been manufactured in this manner to definitely show any advantage from the use of 5/8-inch stock.

Voyage on a Motorship

A Lover of the Sea and of Sailing Ships gives His Impressions of a Trip from Southampton to Capetown on the Union Castle Line Motorship Carnarvon Castle

Our publisher, J. S. Hines, recently received from Repelje Howell of New York a very interesting letter written at sea, en route from Southampton to Capetown. Mr. Howell will be remembered by readers of Pacific Marine Review for his interesting articles on Scrimshaw and old whalers. He is a very enthusiastic collector of momentos and data of old sailing ship days. The letter from which the following paragraphs are taken is especially interesting in that it describes the personal reactions of a lover of the sea to diesel propulsion. Mr. Howell writes—

I THOUGHT you might be interested in a little description of a trip on a vessel propelled by diesel engines. I have made two visits "below" and had a good chance to study the engines under working conditions. It is now twelve days since we left Madeira and the engines have been going day and night ever since, and will not be stopped until to-morrow morning, when we reach Capetown.

We left Southampton Christmas eve at 4:15 p.m. (Friday) and I can tell you it was "awful" cold. Had a rather heavy following sea until Monday afternoon, that is all through the Bay of Biscay and down the Spanish Coast. Beyond a mild rolling, the ship did not seem to be affected in any way.

We got into Madeira early Tuesday morning (December 28) and only lay there three or four hours, sailing at 11 a.m. Had a chance to go ashore and stretch our legs.

Wednesday (the 29th) it began to warm up and Friday, the 31st, we were well into the tropics, all ports open, ventilators and fans going hard, and everyone in summer clothing. New Year's Day was a scorcher—flat sea, no wind. Crossed the line Monday night and it has cooled off a lot since. In fact we are running into a pretty stiff head sea and wind, and the ship is pitching quite a good deal. She is a fine sea boat—torpedo stern and very sharp, flaring bows; 625 odd feet long and 65 beam.

The two main engines are eight cylinder, double acting, of 10,000 horsepower each; 850 m.m. bore, 1500 m.m. stroke. They are giants. They are pretty well forward, so that the shafts are rather long, some 190 feet from thrust block to stern tube. Each shaft weighs 100 tons. The starting and reversing controls are all on the lower grating.

One is impressed with the layout and lack of crowding. In the main engine room are the air compressors and coolers for the blast air, which injects the fuel at some 1500 pounds pressure. The crank case is of course all enclosed, but one is impressed with its size; and speaking of size, you should see the intake and exhaust valves.

One is also impressed with the few men about. Everything seems to be running of itself. The engine room staff is cut to some forty men (20 engineers and 20 oilers) and, of course, there is no fire room force.

By the way, the thrust blocks have but a single collar each, and on these is taken the whole weight of the ship.

Forward of the engine room is the electric power and light plant, consisting of four units. Each unit is a single-acting, four cylinder, 500 horsepower diesel direct connected to its 400 kilowatt generator. Only two are run at a time, as these are ample to take the full load. One set has been running almost continuously since the ship left Capetown on her last voyage, some 7 or 8 weeks ago. It is still going strong.

Beyond the electric plant are what they refer to as the "bunkers." These are the oil tanks. They are over the tank bottom. It is striking to see the space saved by the absence of boilers and coal bunkers. The ship carries enough fuel to take her from Southampton out to Durban and back, some 13,000 miles. As the oil is used it is regulated and pumped from one tank to another and the "trim" is always perfect.

As the mail contract calls for a 17 day schedule, the ship is never pushed. She can do 19 knots; but has been eased down and is doing runs of less than 400 miles a day, average speed 16½ knots at 95 r.p.m. I think running full speed all the time and in good weather, she could cut the run to 15 days to Capetown.

Fresh Fruit for the Orient

PROVISION is being made for 62,000 cubic feet of refrigerator space in each of four of the new 16-knot motorships of the "Silver" type now under construction, according to announcement made by the General Steamship Corporation. These accommodations are being installed in the Silverbelle, Silvermaple, Silverguava, and Silverhazel, to be placed in the round-the-world service of the Kerr Lines, and are provided primarily for carrying fresh fruits and vegetables from the Pacific Coast to Japan, China, Philippines, Java, Dutch East Indies, Straits Settlements, and India.

Los Angeles harbor will be the only port of call on the Pacific Coast, and it is anticipated that in addition to the tremendous demand in the Orient for California fresh fruits, a large movement of apples and vegetables from Oregon and Washington for transshipment at Los Angeles harbor will also be developed.

"The possibilities of the Orient as an outlet for our surplus production of fresh goods has long had the attention of the Pacific Coast," says Drew Chidester, vice-president of the General Steamship Corporation. "The Department of Commerce and the Department of Agriculture are both actively interested in this matter and are now preparing to send men abroad to promote the business on a larger scale. The limiting factor in the past, however, has been inadequate transportation facilities, and we are now glad to announce that we have succeeded in obtaining in these new, rapid vessels this large amount of refrigeration space, which is bound to bring about a rapid growth in the movement. A new field in the Dutch East Indies is also being opened up, as this is the first time that direct transportation of goods under refrigeration to that rich market has been possible. Transshipment at Singapore has heretofore been necessary.

New York Central No. 34

The Latest and Most Powerful Oil Electric Towboat

By J. S. Hines

ON the 26th of January, through the courtesy of Reginald Fay, superintendent of the marine department of the New York Central Railroad, I had the privilege of a very interesting trip around the port of New York on their new oil-electric towboat New York Central No. 34. It was a great pleasure to note the ease with which the captain in the pilot house could regulate and control every movement of this powerful steel boat. In fact one had the sensation of riding in a smoothly running, nicely balanced touring car with an expert chauffeur at the wheel.

New York Central No. 34

The marine department of the New York Central handles a very large fleet of vessels, including in all types 340 craft. There are 66 carfloats with a combined capacity, one-time load, of 884 cars. Twenty-five tugs are kept ready at the command of the dispatcher. The total includes also 40 refrigerator barges for transporting perishables, 101 covered barges, 24 grain boats, 16 gasoline hoisting barges, 9 ferryboats, and a number of lighters, oil barges, and scows.

As the latest development in tug design, embodying the result of long practical experience and expert engineering research, the New York Central No. 34 merits the attention of all who are interested in bay transportation problems.

This tug was designed by the consulting naval architects J. W. Millard & Bros., New York, and was built and outfitted by the Staten Island Shipbuilding Company. While built for towing carfloats and barges on New York harbor, she is fully equipped to take care of herself under all operating conditions. The hull and superstructure are of steel construction thoroughly built to the highest requirements of the American Bureau of Shipping for this service. Among the safety devices is included a complete fire fighting outfit.

Principal Dimensions

Length over-all	108 ft. 3¼ in.
Length b. p	96 ft. 0 in.
Beam, molded	26 ft. 0 in.
Depth, molded	13 ft. 3 in.
Draft	9 ft. 0 in.

Power Plant

The oil-electric power plant consists of two Ingersoll-Rand Type "PR" 6-cylinder, 4-cycle 14 x 19-inch oil engines—each direct-connected to a 270-kilowatt General Electric compound-wound generator and 30-kilowatt exciter. These oil engine generating sets are non-reversing and operate at a constant speed of 265 revolutions a minute. The generators are connected in series and normally supply 480-volt direct current for the 650-shaft horsepower double-armature, shunt-wound propulsion motor.

The propulsion motor, which is direct connected to the propeller shaft, is capable of delivering full power of 650 shaft horsepower at any speed from 115 to 145 revolutions per minute. This highly desirable characteristic for tugboat service is possible only with oil-electric drive.

Either one or both of the oil engine generating sets can supply power for either or both armatures of the propulsion motors.

Control

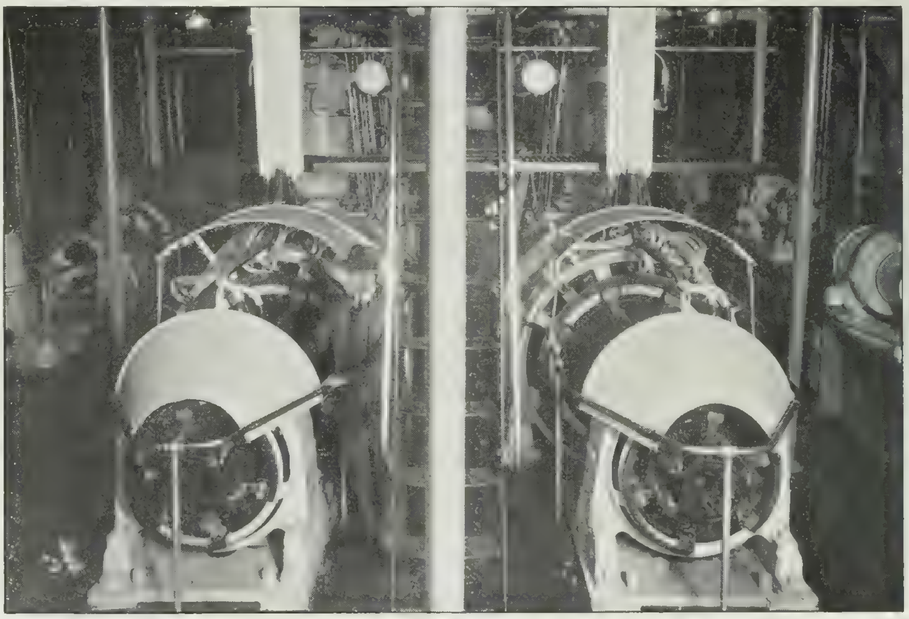
The control is entirely in the hands of the captain in the pilot house. He can maneuver this boat far more easily than he could an ordinary automobile. The control is flexible as to speed variations and is positive to the highest degree.

Duplicate controls, mounted on Cory pedestals, are located one on each side of and convenient to the Hyde electric-type steering wheel. These controls are each equipped with two levers. One lever regulates the revolutions per minute of the propulsion motor; the other, the direction of rotation. These levers are mechanically interlocked to prevent improper use.

Three meters mounted directly in front of the steering wheel show (1) the motor field amperes, 25 to 150; (2) amperes line to motor (0 to 1500, ahead, and 0 to 1500, astern); (3) the propeller r.p.m. (0 to 150 ahead; and 0 to 150 astern).

Main Engines

The Ingersoll-Rand oil engines, each of which develops 400 brake horsepower at 265 revolutions per minute, operate on solid injection of fuel oil. They are of the single-acting, 4-cycle type. The fuel oil is sprayed into the center of the combustion chamber through two opposing nozzles. This results in complete atomization and mixture with the air that is drawn from


Engine room of tug New York Central No. 34, showing her twin Ingersoll-Rand, General Electric diesel generating sets.

SAN FRANCISCO
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the atmosphere into the combustion chamber during the previous revolution.

The combustion occurs without the introduction of electric spark or high-pressure air, being produced as the vaporized fuel oil comes into contact with the oxygen and the heat of air compressed in the combustion chamber.

The simplicity and accuracy of this combustion principle is shown by the unusually high economy and clear exhaust. To drive No. 34 for an hour it requires approximately 25 gallons of oil.

Auxiliaries

The electrical equipment, built by the General Electric Company, is designed specifically for marine application. All the engine room auxiliaries are driven by motors. The power is supplied, through the various switchboard combinations, by power take-offs from the exciters.

A 6 horsepower Hill diesel engine, driving a 4-kilowatt, 120-volt, direct-current generator, supplies power and light for stand-by service. The auxiliary generating set is also connected through a clutch to an Ingersoll-Rand Type 15, 4½ x 5-inch air compressor, which charges the air tank when no other power is available to start the main engines.

An Ingersoll-Rand Type 20 Compressor, driven by a 12-horsepower motor, charges the main air tanks from which the main engines are started.

A Cameron Multi-Stage Centrifugal Pump with a capacity of 500 gallons per minute against 150 pounds discharge pressure is driven at 1700 revolutions per minute by a 75-horsepower motor. This pump supplies water to three nozzles included in the fire-fighting apparatus.

Auxiliary Air Compressor

A service pump of the Northern type (250-500 gallons per minute against 30-pound head) is motor-driven at 575-1150 revolutions per minute through herringbone reduction gears. This unit is run at the minimum revolutions per minute for pumping bilges. It can be used for pumping water out of barges at the maximum capacity.

Two circulating water and bilge pumps, Northern rotary type, are driven by 5-horsepower motors. These units have capacities of 175 gallons per minute against 30 pounds pressure.

A fuel oil transfer pump, Northern rotary type, is driven by a 2-horsepower motor.

The steering motor (1½-horsepower, 115-volt) operates at 550 revolutions per minute.

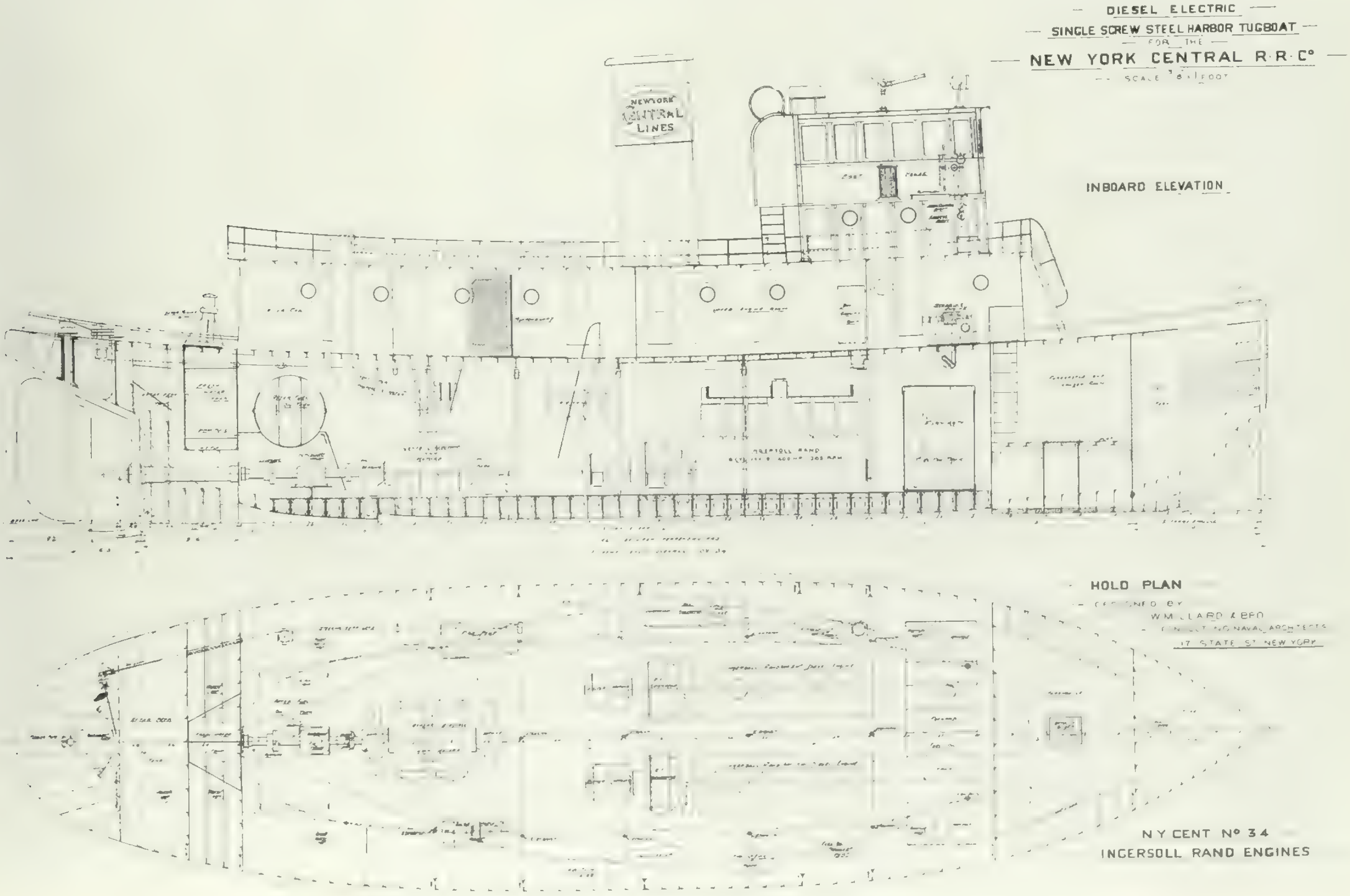
An American Radiator oil burning furnace is used for heating the pilot house, engine, and crew quarters.

Except for size, the New York Central No. 34 is the same in exterior appearance as the others of the fleet. The stack, which is not required, has been retained for housing the exhaust pipes of the engines and for ventilating the engine room.

W. R. GRACE PROMOTIONS

E. T. Ford, manager of W. R. Grace & Company recently announced several changes in the personnel, among them being the promotion of Fred L. Doelker from traffic manager to sub-manager at San Francisco. Doelker joined the company in Seattle in 1914 and became steamer manager. In 1917, he was transferred to the San Francisco office in charge of traffic.

Other changes are R. E. Borchgrevink from manager of the Seattle office to sub-manager of the San Francisco office. Wallace D. Vanderbilt, sub-manager in Seattle, has been promoted to manager there.



Pacific Workboats and Their Power Plants

Fishermen Need Larger Terminal Facilities

THE necessity of soon providing more room for the fishing fleet of small craft at San Francisco is apparent. The berth at Fishermen's Wharf has become so congested that much inconvenience is caused the hardy men who toil to bring in sea food to hungry land folks. One of the largest operators of fishing workboats was lately discussing this subject with a Pacific Marine Review writer. Bryce B. Florence, Secretary State Fish Exchange, joined the party and also spoke strongly of the urgent need of more room for the fishermen.

These gentlemen pointed out that while Fishermen's Wharf has been recognized the world over for many years as one of San Francisco's outstanding features of marine activity, the place had become too small. So much so that delay in landing catches is often the cause of financial loss to the operators. Shelter, too, must be considered, as this is a vital necessity to the sanitary and economical caring for fish cargoes. It was the consensus of opinion of these practical men that it would be advisable that some action toward improvement be taken soon, it being pointed out that with the rapid increase in the number and size of the fishing boats, heavier engines are being installed and larger catches being brought in.

It was suggested that the yacht harbor off the East end of the Marina would be an admirable location for a fishing shelter. While it has long been the plan to build a swimming pool here, it was pointed out that for such a purpose the location is not ideal. There is always a contamination of the waters here, as eddy swirls bring in much flotsam and jetsam which have no place in a swimming pool. Also there is contamination from the main sewer outlet which is near by. Their belief is that a swimming pool should be out near the ocean. The Marina is the best locality for the fishermen. Here, at no great outlay could be created a sheltered harbor with wharves and sheds large enough to take care of the business for many years to come and would be handy to markets.

The ideas advanced are worthy of consideration, for the fishing business of San Francisco runs into many millions of dollars a year and, as it is increasing all the time, it should be fostered and helped by providing a commodious and well located harbor.

New Atlas Units

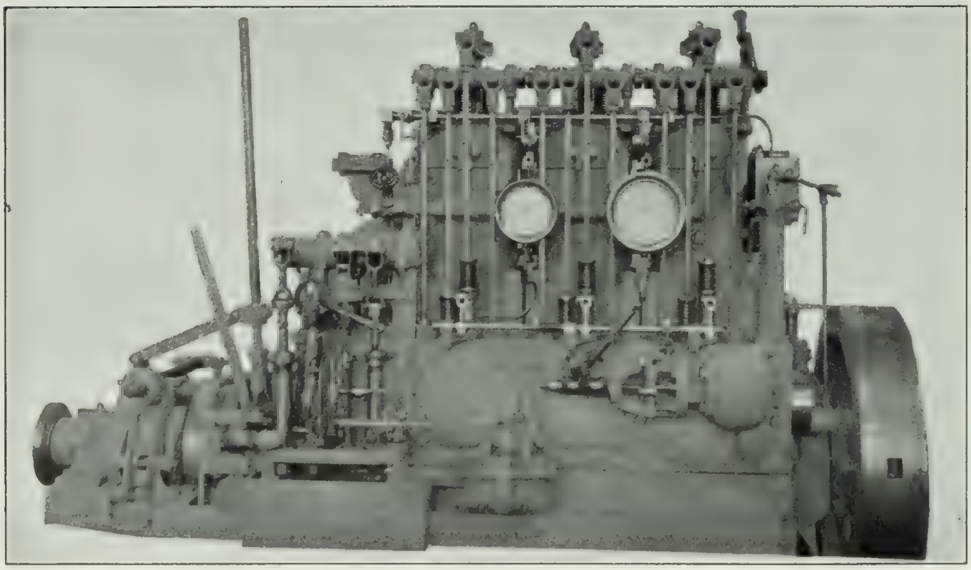
THE Atlas-Imperial Engine Company of Oakland, California, after two years of intensive experimental work, has recently announced the advent of the smallest 4-cycle full diesel, cold-starting, American-built diesel engine. This engine is the result of considerable research work into the fundamental principles of combustion of fuel oil along the lines of solid injection. Various cylinder sizes and stroke bore ratios were tried out, and the result was a decision for a bore of 6 inches and a stroke of 8½ inches, giving a rating of 10 horsepower per cylinder at 500 revolutions a minute.

The first engine to come through production and to be subjected to the regular commercial test showed excellent performance and wonderful economy. No vibration was noted during the test up to speeds as high as 600 revolutions a minute, and as evidenced by the clear exhaust, combustion was perfect. The rating of this engine cylinder is very conservative, and allows for a large surplus power and speed. The general lines of the design follow closely the standard Atlas-Imperial model.

The objects which the Atlas-Imperial Engine Company set before themselves in developing this small engine in response to a popular demand were, first, light weight; second, moderately high rated speeds; third, diesel engine economy, and therefore low cost. The second, the requirement of high rated speed, is the crux of the small engine design. Given successful combustion and good economy at a high rated speed, light weight and low cost follow automatically for any given horsepower rating. The Atlas-Imperial Engine Company is to be congratulated that they have overcome the obstacles presented to successful operation and perfect combustion at fairly high rotative speeds.

This model of the Atlas-Imperial engine is now in production in the three and four-cylinder combinations rated at 30 and 40 horsepower, respectively. The illustration accompanying this article show the neat, compact design of the marine type 3-cylinder size. In conformity with the Atlas practice, this unit is a complete marine power plant. Price quoted on these engines includes reversing gear, propeller, propeller shafting, stern bearing and stuffing box, auxiliary engine compressor unit, air tank, day service tanks for fuel and lubricatin goil, spare parts, muffler, and special tools.

The engines are also in production in the 3 and 4-cylinder size in the stationary type, making an excellent power unit for portable and semi-portable work of all kinds ashore. A 6-cylinder combination of this cylinder size is now being laid out and is expected to be in production at a very early date.



The Atlas-Imperial 3-cylinder, 30-horsepower unit illustrated here is the first Pacific Coast high speed, light weight, marine type diesel engine to be built in the small powers that open up the small boat market to diesel economy.

Workboat Notes

THE former fishing craft Heron, and more lately a rum runner seized by a Coast Guard cutter, has been sold by the government to Lester Bradbury, and is being rebuilt at the Oakland yard of W. F. Stone & Son. Her old gas engine has been taken out and will be replaced by a 75-horsepower Union diesel. Hull interior will be remodelled and comfortably finished as a pleasure cruiser. The Heron is a sturdy and able vessel and when in commission again she will be a fine addition to the cruiser fleet.

A big consignment of Merriman special yacht blocks has arrived at Stone's yard for the yacht Northern Light. These blocks are of a sort not kept in stock, being fitted with bronze roller bearings and lignum vitae shells. Some of them are 14-inch size, and the cost of the outfit for the vessel will run into several thousands of dollars.

The San Francisco Bay freight boat South Shore No. 2, clearing from San Francisco wharf with freight for Mountain View. The South Shore No. 2 is powered with two 75-horsepower Atlas-Imperial diesel engines.

The shops of the **Atlas Imperial Engine Company** are busy building diesel engines for many marine jobs. On the test block is a 6-cylinder 200 horsepower unit which will be shipped to Alaska to replace a steam plant taken out of the McDonald Lumber Company's workboat Inverness, which operates in Ketchikan Sound log raft towing. A similar engine has been ordered by the Alaska Packers Association to be installed in one of their heavy fishing tugs.

Another job of interest is the rebuilding of one of the old-time air-injection diesels in service twelve years. New heads and valve gears will be made and placed, converting her into a solid injection type. The original cylinders and shaft will be retained, showing that twelve years' constant work has not harmed them. All these years the engines did good service in the workboat Ajax. The hull of this boat will be reconditioned and, with the remodeled engines, will be again good for long use.

The new type 4-cylinder 70-horsepower diesel engine lately put out by the Atlas-Imperial Engine Company is making a great hit in Hawaii. Orders for several have lately been received from the Honolulu Iron Works, the agents there.

A 6-cylinder 200-horsepower direct-reversible diesel has been ordered by the Knappton Towing Company of Astoria, which will be installed in one of their workboats used in general service on the Columbia River.

The Hunt-Hatch delta workboat Oakland, which has two sets of 150-horsepower diesels of Atlas-Imperial build, is having her annual overhaul at Oakland.

Western Enterprise diesel engines have been recently installed in two workboats at the Panama Canal. These are of 80 horsepower each. Another, a 60-horsepower unit, has been placed in a new fishing vessel at Vancouver, British Columbia, while two 110-horsepower diesels have been shipped to Honolulu for powering two sampan fishing craft. Texas mining interests have bought a 200-horsepower diesel and the state of Idaho a 120 horsepower engine for stationary use. In the gas engine branch of the Western Machinery Company, builders of these diesels, there is pronounced activity, the shops being operated twenty-four hours per day to keep pace with orders for field engines and hoists.

Retired Cop Captains Workboat

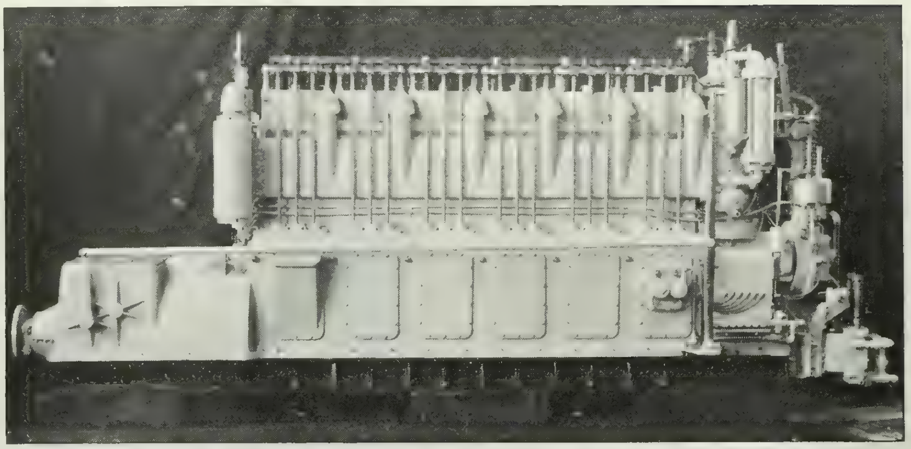
SOMETIMES the prosaic workboat operators have experiences which demand resourcefulness and quick action. Such happened recently when the boat D. A. Drake, deeply laden with a heavy deck load of garden truck from the lower Sacramento River, broke her rudder. Captain W. Samuels, her skipper, rigged a jury rudder and made the San Francisco docks all right.

Captain Samuels was for twenty years a member of the San Francisco Police force, and just could not keep still when he was retired. He took up the workboat business and has done fine in it, and though his hair is white and his years are many, he looks hale and hearty, showing that the outdoor life on bay waters is conducive to health and longevity. With a new rudder shipped the veteran police officer-captain again pilots his craft to and from the delta district.

The D. A. Drake is a unique vessel in that her twin screws are driven by two heavy duty marine type gas engines, one built by the Standard Gas Engine Company, the other by the Enterprise Engine Company (now Western Machinery Company). For some years these units have been working harmoniously together and Captain Samuels has not yet decided which one is the better engine.

Ship's tackle on the McCormick steamship Redman lowering power life boat Point Reyes from ship's deck to water alongside.

Winton Engine at Show



Winton Model 114 marine diesel engine as displayed at the recent New York Motorboat Show.

THE Winton Engine Company of Cleveland, had an especially interesting exhibit at the recent New York Motorboat Show for those who are interested in getting a close-up view of the latest developments in diesel engine design and construction. This company had on display a pair of their Model 114 diesel engines and also one of their Model 109 air compressor sets.

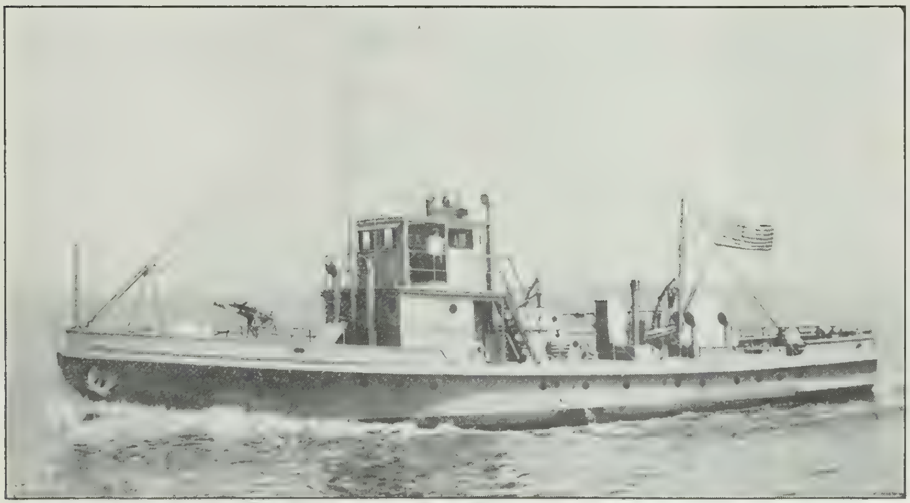
The Winton Model 114 is the engine which the United States Government has recently installed in 44 of their Coast Guard patrol boats. Each of these boats is powered with a pair of these engines and one Winton Model 109 air compressor set. This Winton Coast Guard engine is rated at 150 horsepower at 450 revolutions per minute. Since the Government contracted for Winton engines in these boats, marine men in this country have manifested a great deal of interest in the type of engine that the Winton Engine Company has built for this service and, consequently, this exhibit received special attention.

These patrol boats are exceptionally sturdy ships. Their service necessitates remaining at sea for long periods without returning to port and they are called upon to face all kinds of weather. In order to satisfactorily meet the strenuous demands made upon them, their power plants must be exceptionally rugged, dependable, and economical.

Our illustrations show one of these boats and the Winton diesel engine with which they are equipped. These engines are of the 4-cycle type, with six cylinders having 8-inch bore and 11-inch stroke. They are equipped with the Winton special planetary type reverse gear, all gears and pinions cut from special forged steel and running in oil supplied by the engine lubricating system. The weight of each unit, including air throttles, instrument board and gauges, service fuel pump, and set of tools, is 13,500 pounds.

Auxiliary Air Compressor

The Winton auxiliary air compressor with which the Coast Guard patrol boats are equipped, has a capacity at 700 revolutions a minute to deliver three cubic feet of air per minute at 900 pounds pressure. It is of compact yet readily accessible design, built of the very best materials, provided with high and low pressure air coolers, and with efficient lubricating system. Driven by a 3-horse-power, 32-volt Westinghouse motor, this complete weighs only 750 pounds.



One of the U. S. Coast Guard patrol boats, 44 of which are powered with two Model 114 Winton diesel engines.

Better Lining for Ship Ranges

Ramtite lining on the galley range of steamer La Perla after eight months' continuous hard use.

THE United Fruit Company's steamship La Perla is equipped with a cooking range originally designed to burn coal. Since the ship burns oil for power, it was decided to change over the ranges to oil burners. Trouble immediately developed with the brick linings. The brick would spall and fall out and it was necessary to reline the ranges every trip of three or four weeks at an expense of $65 to $75.

After a great deal of expense of this kind it was determined to find a better lining for this service. Investigation led to the selection of "Ramtite," manufactured by The S. Obermayer Company of Chicago. A ship carpenter made the installation. The chief steward, however, having some misgivings about such a material, loaded a set of grates and four tons of coal.

The lining was not renewed at the end of that trip nor the next. In fact, the illustrations herewith shows these original linings photographed over eight months after they were installed.

Auxiliaries—Ship Supplies—Marine Equipment

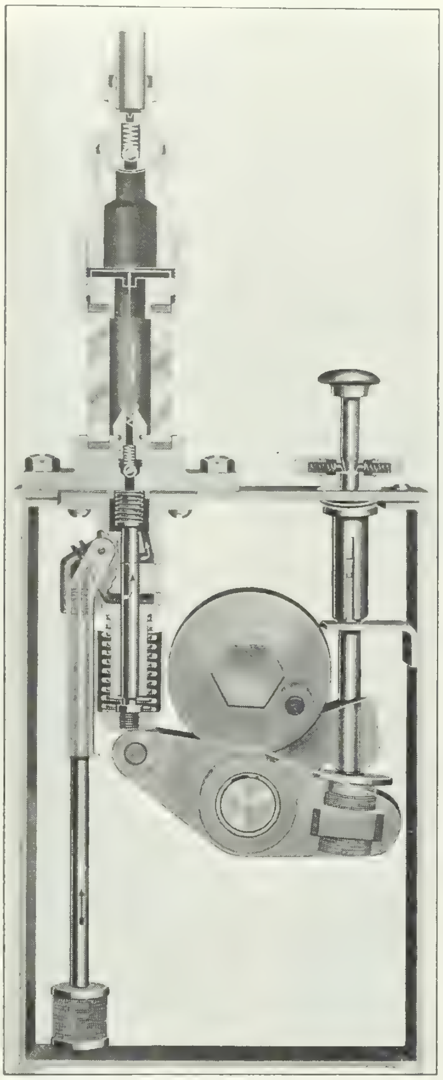
New Type Manzel Lubricator

LUBRICATION of the cylinder walls and pistons of diesel engines has been a problem since that type of motor has come into use. It is evident that to insure a proper application of the lubricant to the piston and piston rings the oil must be injected into the cylinders at the instant the pistons are opposite this point of oil entrance. In other words, a timing arrangement must be employed to effect the admission of the oil. The Manzel lubricator, No. 77-A, is claimed by the manufacturers to accomplish this desired result.

An improved force feed pumping unit has been designed that positively prevents any air from entering the lubrication system. Each of these forcing or pump units is so arranged that it can be taken out of the block for inspection without disturbing any other unit. The feed regulator controlling the amount of oil is provided with a sight feed glass, and the entire mechanism is placed below the normal level of the lubricant in the reservoir. One unit of an assembly can be arranged to deliver oil to bearings in predetermined quantities under bearing pressure, while another unit delivers a determined quantity of oil to the interior of cylinders under great pressure and times exactly synchronous with the movements of pistons.

In connection with the improved force feed lubricator is a delivery valve at the cylinders. This valve is screwed through the walls of the water-jacket and cylinder liner, with a sliding joint through the former to allow for expansion. This joint is packed water-tight with a resilient material. The fixed point in the cylinder liner is screwed metal-to-metal with a taper thread. The valve body is of stainless steel to resist corrosive action of salt water, and the point where the delivery of oil takes place is made of a softer metal so that should the valve be screwed too far through by carelessness or mistake, the soft point would be cut away without injury to the piston rings. This special valve was originated by one of the engineers of the Manzel Bros. Company in California, and is unique in its application.

As will be seen by the drawings, these pumps maintain constant volume in the oil line at all times though under no great pressure except at the instant when delivery of oil is desired. Then the pressure mounts quickly and, having a large area of diaphragm to act on, opens the valve suddenly, allowing the lubricant to be shot into the cylinder at exactly the right instant. This time of pressure is regulated by a timing mechanism similar to that used in regulating the spark on a gas engine and can be as accurately regulated. The forcing pump is actuated by cams which can be set easily to meet all conditions and for any number of cylinders, from two to eight, and equally positive in all cases. Hand pumps are built into the assembly so that if any extra amount of oil should be needed for emergency it can be forced in.


Sectional view of mechanism of the Manzel Lubricator No. 77-A

It is of course necessary for the maintenance and efficiency of a diesel engine to have the cylinder walls and pistons lubricated with regularity and certainty, and the Manzel force feed lubricating device meets these requirements. These newly perfected units are to be used on the large diesel engine built by the Pacific Diesel Engine Co. for the Shipping Board, which are of 3000 horsepower. The motor ship Carriso has also adopted the same type. Lubricators for large diesel engines are built to order on exact specifications, as differences in cycles or number of cylinders demand different designs for timing cams and other features.

In addition to these specially constructed types of lubricators, the Manzel people build many varieties of oiling devices for use in all classes of engines and machinery. H. K. Moulthrop, the company's service engineer for the Pacific Coast, with offices in the Atlas Building, San Francisco, will be glad to furnish expert advice on lubricating problems. Agencies for units and parts are established in all principal cities of the West, and thousands of Manzel lubricators are used on the Pacific Coast from the southern oil fields to the saw mills of the northwest and the sugar mills of Hawaii.

Fire Protection on New Tanker

ONE of the largest tankers ever built in the United States was launched recently at the yard of the Federal Shipbuilding and Dry Dock Company at Kearny, New Jersey. This new tanker is being built for the Gulf Refining Company and will be called the Gulfpride.

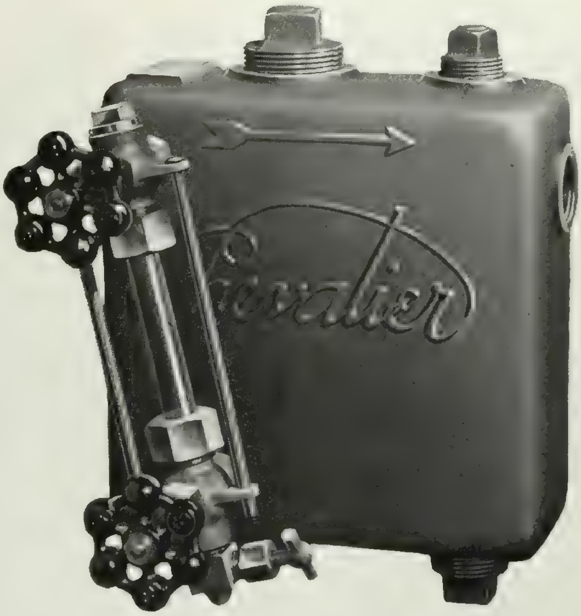
The Gulfpride has a length of 525 feet, beam of 74 feet and a gross tonnage of 15,000. It will have twin screws driven by two Bethlehem diesel engines of the 2-cycle type. An interesting feature is that this tanker has been constructed according to the new Isherwood bracketless system. It is the first vessel on which this type of construction has been used in America.

Another noteworthy feature is that the latest devices have been adopted for the control of fire. This is especially interesting in view of the numerous tanker fires that have occurred lately. Virtually the entire ship is to be protected by the Lux system for extinguishing fire with carbon dioxide, for in addition to the cargo oil tanks, cofferdams, and pump rooms, CO_2 extinguishing is provided for donkey boiler room, paint and lamp rooms, and stores. A conflagration occurring in the diesel motor room can be smothered out by filling the entire space of upwards of 130,000 cubic feet of air space with the non-poisonous gas released from steel flasks in which it is stored under compression.

The new Gulfpride will surpass in construction details and safety features the Gulfcrest, completed last year for the same owners. In about two months, final work will be completed and after a trial trip this great tanker will be turned over to the Gulf Refining Company.

Chevalier Condensation Drainer

(Copyright by Chevalier Inc., 1927)



Chevalier Condensation Drainer

THE Chevalier Condensation Drainer is a device for removing steam condensation from steam lines and equipment using steam for heating. The basic principle of its operation is thermodynamic — not thermostatic or mechanical, as is the case with other devices hitherto available for the work it is designed to perform. It contains no moving parts. The need of moving parts is obviated by taking advantage of the physical laws pertaining to the behavior of steam and hot water under pressure, thereby utilizing the mechanical qualities of steam re-evaporated from hot condensate to do the work of moving parts.

The working principle of this apparatus is so uniquely and effectively different from that of the usual steam trap that the term "Chevalier Condensation Drainer" was adopted to distinguish it from all other devices used for handling condensation.

The Chevalier Condensation Drainer is a chambered cast-iron block, made in one size, the outside measurements of which are 7½ inches long by 7½ inches high by 3 inches wide. The inlet and outlet connections are tapped for ¾-inch pipe.

The capacity is controlled by a combination of an orifice and a tube, with fixed areas bearing a definite relation to each other for each combination used. The combinations have been standardized for various applications and pressures. When the equipment to which the drainer is to be connected is known, the proper combination is assembled at the factory. This is not essential, as it is a very simple operation to change the combination of the orifice and tube to suit a condition after a drainer has been installed.

When once a combination is set in a drainer for a known condition (pressure or variation in pressure and range of rate of condensate discharge), no further attention is required nor change necessary.

The maximum capacity of any combination is subject to the initial pressure at the inlet and the differential in pressures between the inlet and the outlet of the drainer.

The range between the maximum and the minimum discharge for each combination is considerable, permitting the drainer to take care of a variable amount of condensation and over a wide range of pressures. The discharge of condensation is cntinuous. This insures dry steam in the equipment drained, resulting in constant and maximum temperatures. The pressure against which a drainer will discharge, or the height to which it will elevate condensation (back pressure) depends upon the initial pressure. There must be a differential in pressures between the inlet and the outlet.

The casting of the drainer is made of close-grained gray iron; the orifice discs are of nickel alloy; and the tube of Monel metal. The orifice discs and tubes are accessible through plugged holes directly above them. Standard pipe plugs are used to close the apertures through which the orifice and tubes are placed so that in the event of misplacing or losing a plug it is easy to replace it from the supply of material aboard ship.

The drainer is equipped with a water gauge—the side on which the gauge is located being optional. This is for convenience of observation, and is therefore determined by the location of the drainer on the equipment.

The terms "right-hand" and "left-hand" are used to indicate the side on which the water gauge is mounted. A "right-hand" drainer has the gauge on the right side when looking from the inlet toward the outlet. The gauge on a "left-hand" drainer is on the left side when looking from the inlet to the outlet.

The drainer is applicable aboard ship for the removal of condensation from whistle line, fuel-oil heater coils, fuel-oil tank coils, steam equipment in galley, radiator systems, water heaters and steam headers to engine and auxiliary equipment.

The Chevalier Condensation Drainer is easily installed, occupies but small space, and requires no by-pass. The drainer needs little or no attention after installation, except the occasional blowing out of sediment through a one-half inch valve provided for that purpose.

The drainer is reliable and continuous in its operation. Having no moving parts, there is nothing to wear out. Therefore overhauling and repair parts are unnecessary. It is particularly adaptable to marine usage. Vibration or any motion occurring aboard ship does not affect its functioning.

American Engineering Representative

W. V. A. Kemp, Pacific Coast representative of the **American Engineering Co.**, of Philadelphia, has offices in the Rialto Building, San Francisco. The marine and auxiliary machinery manufactured by this firm is most favorably known among shipping men. Several new and improved units have been added to their output, particulars of which can be obtained from Mr. Kemp by those interested.

The new naval cruiser now building at the yard of Wm. Cramp & Sons' Ship & Engine Building Co., Philadelphia, will be supplied with hydro-electric steering gear by the American Engineering Co. This gear is of the same type as that on the U. S. S. Saratoga. Due to her high speed and size, exceptionally heavy construction was necessary. An idea of the power required can be gained from the fact that the rams are 24 inches in diameter, with a working pressure of 3500 pounds per square inch.

TRADE LITERATURE

Chas. Cory & Son, Inc., of New York are now distributing their new bulletin No. 60-29-A, which describes "Annunciators, Bells, Buzzers, and Signal Equipment." They will send a copy to you if you will write direct to them and mention this publication. The book contains 60 pages of descriptive matter and 117 illustrations and is well arranged with complete alphabetical index and subject thumb index.

The equipment illustrated in this bulletin shows great evidence of scientific designing and development of manually and automatically operated visible and audible signals for all routine communication requirements.

Some of the specific uses cited are, audible and visible fire alarm, call bell, routine instruction, automatic warning signal, steward and stewardess, nurse, attendant, building superintendent, messenger calls.

Comprising as it does, annunciating indicators and audible signals for marine and industrial purposes, with a special section devoted to central station annunciators, this handy reference bulletin presents to its readers a collection of valuable data and interesting illustrations.

Corrosion in Tank Steamers

By A. C. Holzapfel

THE matter of corrosion in tank steamers is now being ventilated, largely thanks to Mr. Bennett's paper read at the recent meeting of the Society of Naval Architects and Marine Engineers. In my remarks on that paper, I suggested that the direct contact between the oil cargo and the rivet heads in the tanks might cause lubrication of the rivets in their sockets and thus cause local weak spots which would throw additional strain and consequent weakening on other rivets.

Several eminent shipping men and naval architects have since informed me that they consider this theory correct. Since that time I have been wondering why so much external corrosion of even apparently sound rivets takes place. I have now found the probable cause in a recent publication by the Parkersburg Rig & Reel Company of researches on the corrosion of storage tanks by E. G. Woodruff, R. L. Ginter, and L. G. Bignell.

From these researches it appears that the presence of sulphur in oil and the consequent deposit of sulphur fumes on the under side of tank covers, ships' decks, and other spaces not in direct contact with oil causes a direct combination between the sulphur and steel in the formation of sulphide of iron. This then falls in flakes to the bottom of the tanks and sets up powerful electrolytic action. The electrolytic current thus produced can only exhaust itself in parts of the structure which are in contact with some disintegrating factor like sea water. So those parts of the external surfaces of the vessel which are not efficiently protected by paint are subject to very rapid deterioration. Mr. Bennett already referred to electrolysis as the probable cause of some of this exceptional corrosion but did not suggest how it was caused except by the probable presence of a slight percentage of copper in the ship's plates. This new theory casts a new light on the subject and on the desirability of finding a remedy.

This remedy would have to consist of a paint material which will have to fulfill the following conditions:

First: It must be capable of preventing contact between the sulphurous vapors and the ship's inner structure. It must also be proof against any acids present in the oil cargo.

Second: It must be insoluble in gasoline and its vapors.

Third: It must be adhesive to steel plates.

Fourth: It must be in the form of a quick drying paint and must not, while drying, give off noxious or explosive vapors which cannot be removed by such ventilation as may be available on board the vessel.

I believe that the Rubshell paint, which I mentioned in the discussion of Mr. Bennett's paper, will fulfill these conditions; but only if it is applied to the true surface of the steel after careful removal of all scale or rust and after neutralizing any acid which may be present on the plates by a wash with a solution of ordinary soda in the proportion of one pound to each gallon of fresh water, heated to boiling point by preference for then its action will be more rapid and reliable. Next, the surface coated should be entirely dry. The application can be very rapid as the paint dries in 30 to 60 minutes. Three coats should be applied the first time, the first being Rubshell priming.

The next question is how long will such protection last? I am not certain, but I believe in a vessel carrying heavy oil it may last for many years, probably as long as the ship, because the oil film will exclude the atmosphere except on the under side of the deck, where it should be renewed the first time, say after a year, by the application of two more coats, subsequently every two or three years.

In vessels carrying gasoline Rubshell should be renewed throughout at the end of the first year, subsequently throughout every two or three years.

It is my belief that in this way this long standing evil can be effectively and finally combated, but in bringing this material before owners of tank vessels I have to ask their cooperation.

Improvements in the manufacture and application will surely follow in due course of time, but these can only be developed by actual experience This can be obtained by the help of the future users of Rubshell, but already I can say with the fullest assurance that for every dollar now spent there will be a saving of at least ten dollars to the owner of the vessel.

The Pedersen Oil Jack

THE Oil Jack Company, Inc., manufacturers of the Pedersen Oiljak, announces the removal of their general offices to 15 Park Row, New York City.

They advise us that they are now in full production on the two popular models of the Oiljak, the JB-3 (up to 3 tons) and the JB-10 (up to 10 tons); and jobbers in all industries everywhere are having their orders filled promptly.

The Pederson Oiljak is an unusually versatile jack, the two sizes being applicable to all kinds of light duty and heavy duty lifting work. They are being used nationally for automobiles, buses, and trucks; by fleet operators, garages, service stations; by builders and contractors; in industrial plants, shipbuilding, and marine work; electric light and gas plants; agricultural work; in mines, water works, construction; by municipal and highway departments, fire departments, steam and electric railways, oil producers and refiners.

The Oiljak embodies novel applications of principles long recognized as of prime importance in the design of lifting devices and overcomes difficulties which have prevented successful use of these principles in the past. There is absolute control of lifting of the load the instant you stop pumping at any point of stroke either up or down. The load positively holds its position.

With the Pedersen Oiljak, any load within the limit of the jack's capacity can be raised with little effort, steadily, smoothly, and quickly. It also lowers the load without jar or shock and can be instantly stopped in any position. Moreover, the jack may be operated with little, short, inch-by-inch motions of the handle if desired. A full stroke is not necessary as in the case of most jacks. This makes the Oiljak particularly practical for the use in cramped quarters. Also in dangerous quarters, this jack can be operated at a distance by using a longer handle.

Packing

The France Packing Company of Philadelphia have recently put on the market an improved metallic packing built up of a shredded material. The plastic metal is in long strands, impregnated with lubricant. These strands can be braided into any size desired without waste and applied by the engineer as needed. Besides the loose form, the new material is sold compressed into rings with concave or convex section and of any diameter. In this form it makes a very readily applied packing, which the makers claim has no equal for such service. The France Packing Company also make the well-known vanadium metallic packing, which can be used with present glands on engines, or special shells may be built into the job if desired. The C. E. Rhodes Company of San Francisco are California distributors of these special goods.

Barge Canal Buoy Lighting System

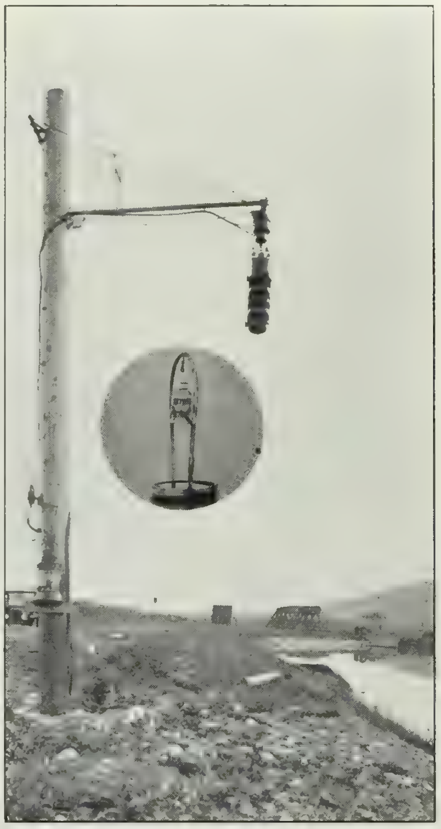
THE New York State Barge Canal is a system of waterways in the state of New York based on the improvement and enlargement of four canals; namely, the Erie Canal, the Champlain Canal, the Oswego Canal, and the Cayuga and Seneca Canal.

The old Erie Canal is second in length only to the great Canal of China. Extending across the state from Buffalo to Albany and connecting the Great Lakes with the Hudson River and tidewater, it contributed probably more than any other influence to the establishment of New York City as the commercial center of the eastern coast of the United States.

With the construction of the Barge Canal, the old Erie Canal went out of existence. Work was begun in 1905 and the new Barge Canal opened to traffic in 1918. The resulting state waterway system is 525 miles long. The canal provides a channel with 12 feet of water, at least 75 feet wide at the bottom.

Seventy-one per cent of the area of New York State is within 50 miles of these waterways. Cargoes are transported in barges averaging about 500 tons capacity, taking grain cargoes of about 20,000 bushels per barge. The ordinary canal fleet consists of a steamer or tug with three to six barges in tow.

The buoy lighting system has always been more or less of a problem. The first lights were kerosene lamps installed at various points along the channel as a guide to boatmen traveling at night and during foggy periods. During the winter of 1918 and 1919 an inspector of the Department of Public Works, realizing the trouble in maintaining the lamps, the cost of operation and replacements, endeavored to develop some practical means of substituting electric lights for the kerosene lamps.



The new type of electric flashing lamp for canal service as hung on poles along the New York State Barge Canal. Inset shows the old kerosene floating buoy type formerly used.

As an installation of low voltage parallel circuits was not practical owing to the length of the circuits, a constant current series system was suggested. It was worked out in detail, and in 1924 the matter was brought to the attention of Colonel Frederick Stuart Greene, Superintendent of Public Works, who secured an appropriation from the legislature for a trial installation. This was installed for 2½ miles on each side of Lock No. 19 near Utica. The test of the electric flasher system would seem to indicate that it is the successful solution of the lighting problem on barge canals.

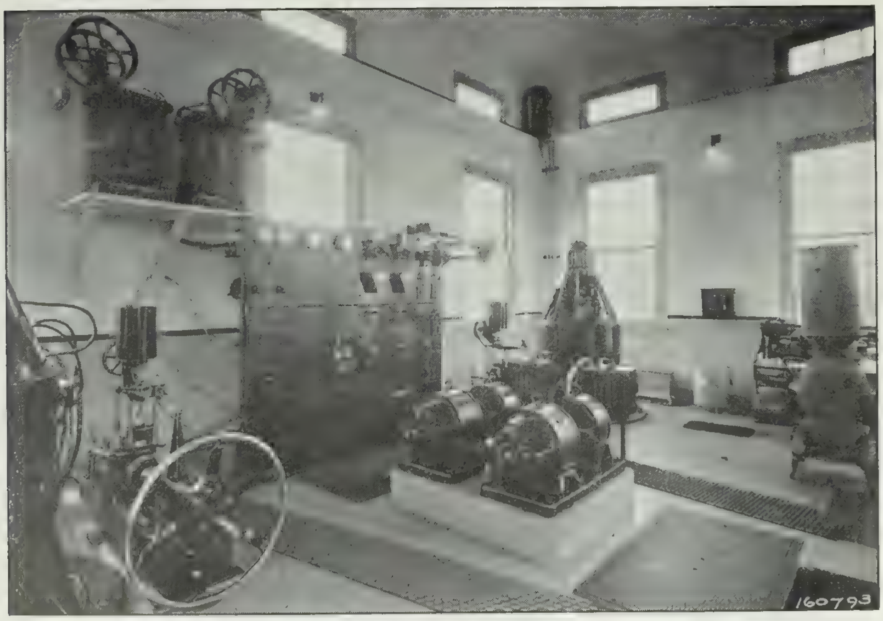
Preliminary engineering and construction details were developed by Fred R. Lindsey, electrical inspector for the Bureau of Canals, with the assistance of the Westinghouse Electric and Manufacturing Company's engineers working in collaboration. A special flashing mechanism was developed for this system. A lantern of entirely new design was worked out which contained two electric lamps; one for normal use and one for emergency. Should one lamp fail, the emergency lamp is automatically cut in, thereby assuring practically continuous service. Each lantern is fitted with a disconnecting device which enables the operator to disconnect the entire lamp from the circuit for repairs or replacement. It also contains an automatic cutout which maintains light on the system in case that both lamps burn out or the lantern is destroyed.

The system obtains energy from the lock through a motor-generator set, which delivers 220-volt, 60-cycle, single-phase energy to the constant current regulator. The energy is then passed, through suitable switching equipment, through the flashers, and by underground parkway cable to the lanterns mounted on poles and bridges or suspended over the channel.

The complete equipment was furnished by the Westinghouse Electric and Manufacturing Company from its East Pittsburgh, Pa., and South Bend, Ind., plants. The lamps are placed approximately 25 feet above water level and their supports are so located as to be free from damage by ice, flood water, or boats drifting out of the channel.

The flashers are constructed so that the lights can be flashed with an equal period of light and dark; the cycle can be varied from 10 seconds to two minutes as desired. The location of the lights is such that they may be easily seen at least twice the distance of the old lights. In consequence, one electric buoy takes the place of two kerosene buoys. This economy results in a great saving in installation and maintenance.

It is necessary to remove the present kerosene light buoys each fall and put them in storage, replacing them before navigation opens in the spring, and often during the spring when the water is high they are likely to be moved off location and thus become



The power plant of Lock No. 19, New York State Barge Canal, showing motor generator sets and switchboard equipment.

a menace rather than an aid to navigation. It is expected that this new lighting system will lengthen the navigable season on the canal.

The maintenance charges against the electric system, as figured from this experimental installation, work out at roughly $15 per lantern per year, as compared with $57 per buoy per year for the kerosene system.

Boatmen and navigation companies have commented favorably on the trial installation on the canal east of Utica. It has all the elements of safety and visibility so important to canal navigation. The Superintendent of Public Works should be highly commended for developing this system which should prove a great advantage to users of the canal. It is superior to the old system, in that it is cheaper, permanent, and requires a minimum of attention. Naturally, the personnel of the New York State Barge Canal and the engineers of the Westinghouse Electric and Manufacturing Company are pleased with the way the installation is working out.

External view of Lock No. 19 showing method of lighting by the new electric system, New York State Barge Canal.

Welding and the Welding Rod

MANY people have the idea that the personal equation is the difficult problem in welding. "Everything depends on the welder," they say, and then proceed to ask "How can I be sure he is a good workman?"

Important though this matter is, it must be emphasized that the workman is only one factor in the correst procedure control. True, you must have good welders (and they are obtainable and teachable and reliable), but they must also have good materials to work with. It is of the utmost importance to standardize on materials of high and unvarying quality.

The best of blowpipes and the highest grade of welding rods and fluxes will so facilitate welding that their use will be soon repaid many times over. Since one of the most important of these items is the rod, the largest manufacturers of welding equipment and supplies are devoting great attention to developing new and improved welding rods.

One of the simpler tests which are commonly used can readily be made by any operator in order to determine the excellence of his present supply. Place a rod on a welding table so one end extends well over the edge. Then melt it with a blowpipe, watching for impurities or cavities. A good rod will melt easily and quietly with practically no sparkling. Another good test can be made by laying the rod on a metal slab and then remelting it repeatedly. The first time the blowpipe has been moved slowly along, there should be no excessive sparkling, and no pin holes should remain in the melted metal. A second or third application will show proportionately more sparkling and a larger number of pin holes. But if there is a great increase each time the rod is not of very high quality.

A good rod, one which can withstand such tests, gives a good weld because it has no impurities to be left in the weld metal and no gas pockets to prevent steady and smooth flow.

In actual work the operator can recognize good welding rod with no trouble at all. The rod should flow easily without excessive sparkling; it should be easy to control even in overhead welding and should be capable of being worked rapidly. For most work another prime consideration is strength; a good welding rod should give a weld which when properly made is stronger than the best quality of flange steel or boiler plate.

One of the first types of rod used extensively for oxy-acetylene welding was of almost pure iron from Norway and Sweden. When the supply of this material was cut off during the early years of the World War, the low carbon steel or so called "drawn iron" rods replaced them. Norway iron has therefore lost its precise meaning; most of the welding rods called Norway iron are merely of low carbon steel made in the United States especially for its welding properties. The weld metal resulting from its use is practically pure iron, and contains only 0.02 to 0.03 per cent of carbon. Consequently joints made with this rod, while tough and ductile, are no stronger than the softest staybolt iron.

An important factor which must be anticipated in the development of new welding rods is the change in chemical composition which takes place when they are melted by the blowpipe flame. Consequently they must be of such composition that the metal in the weld will be of high quality, sound and strong.

An important development in welding rods is the recent High Test Rod put on the market in 1925. Prior to this, from 1923 to 1925 operators employed in railroad shops all over the country used this type of rod. It was their success with it that created the general demand. Welds made with this rod, whether by second rate or by the best of operators, will regularly average 11,000 pounds per square inch stronger than welds made by the same man with low carbon steel rod. It is an alloy steel, its essential chemical composition being carbon 0.20 per cent; manganese 0.80 per cent; silicon 0.55 per cent. The weld metal retains nearly all the carbon. The manganese and silicon lost in melting act as a self-flux; hence the strength and soundness of joints made with it.

Every welding operator and every manager who directs welding operations will find that quality and correct composition in welding rods are matters of utmost importance. Given good rods, a good welder can be sure of the highest possible strength and quality in his welds; and even a welder of indifferent ability can improve results by wise selection of such material.

Thermit Saves Time

TWO Thermit welding jobs were made recently at the Maryland Dry Dock Company, Baltimore, Maryland, on the U. S. Coast Guard cutter Carrabassett and the steamship West Cobalt of the United States Shipping Board.

The weld made on the Carrabassett was on the stern shoe that was broken just aft of the stern frame through a section 4 by 14 inches, and the weld on the West Colbat through a section 9 by 21 inches in the lower gudgeon of the rudder post.

Both welds were successfully carried out under the direction of the Metal & Thermit Corporation's operator in a limited amount of time as it was necessary to float the ships as soon as possible.

Making Ship Fumigation Pay

Suggestions for Getting Your Money's Worth from Fumigation

By Roy W. Kelly, Industrial Engineer

IN recent years ship fumigation has become a burdensome expense for ship owners and operators. Fumigation of the average oil tanker runs from $35 to $50, while the fumigation of large passenger boats and similar vessels may run to $100 and more. The direct expense of fumigation is the least part of the cost. Delays of one to two days are not uncommon and the crew is sent ashore during the time the ship is in charge of the fumigating crew. This sometimes involves launch hire for transportation of the crew ashore and back again. In some cases it is necessary to move the boat to some position designated by the fumigators. All told, the annual expense of fumigating every six months may run into several thousand dollars, the largest cost involved being in the delay to the ship and in clearing from port.

With these circumstances in mind, it is worth while asking some questions as to the real reasons for fumigation and the methods which should be used by the ship owners to make sure that they get their money's worth from the work done.

The present United States Quarantine Regulations issued in 1920, conform to the following recommendation issued by the Paris Convention held in 1912. Section 103 of the existing Quarantine Regulations reads:

"All vessels engaged in trade with foreign ports, shall be fumigated not less than every six months. This is best done when the vessels are empty."

Fumigation was adopted as a method of control for bubonic plague. This dread disease swept away thousands of persons in foreign countries and its inroads have been felt in a few of our American cities. The plague is spread by means of fleas which are carried from infected persons by means of rats. It is claimed that a sprightly flea of the sort properly described by the Irishman's dictum "Now you got him, now you ain't," will carry the plague bacillus, or germ, for as much as forty days. Fleas by themselves do not travel very far or very fast. They easily infect rats, however, and the infected rats spread the plague.

Another disease which is partially controlled by fumigation is typhus fever, which is spread by body lice. These never travel very far from the patient and his clothing. Live insects are usually killed by proper cyanide fumigation. To a limited extent fumigation is a control measure against yellow fever and malaria, which are carried by mosquitos.

It is not generally understood that cyanide gas is a very poor disinfectant. Its chief purpose is to destroy insect and rodent life which carry disease germs, rather than to kill the disease germs themselves. From the point of view of the ship owner, ship fumigation should not merely kill rats, but it should also get rid of other undesirable pests. The most important of these are cockroaches, bedbugs, fleas, mice, and lice.

If rats are left undisturbed with plenty of food available, they soon become extremely numerous. As many as 1700 rats are said to have been killed on one vessel. The average female rat reaches maturity at the age of three or four months. She gives birth to from six to ten litters per year, with from ten to twenty or more young in every litter. This means that if practically all the rats are killed on board the ship at the time of fumigation, at least six months will elapse before the birth rate will enable them to become annoyingly numerous.

Mice breed somewhat faster. There are more litters in a year, but fewer mice in a litter. Fumigation once in every six months, if properly done, kills all of the mice and keeps them well under control.

The cockroaches found on board ship are of four different kinds. The most common kind of cockroach is sometimes called the "Croton Bug" and may also be called a "German Cockroach." The female insect reaches maturity at about the age of three months. The eggs are carried by the female in a little flat rectangular capsule attached to the body of the insect. These eggs hatch in thirty to forty days, depending on the temperature. After being laid, the eggs live independently of the life of the parent. This means that if some bloodthirsty seaman hits Mrs. Cockroach with a belaying pin, he doesn't kill the eggs and the family of little cockroaches arrives on time regardless of the funeral. Because of the length of time for a young cockroach to reach maturity and the number of days required to hatch the eggs, a fumigation every six months gives very good control. It should be understood, however, that the present methods of fumigation are not usually carried out in such a way as to kill the eggs.

The nits or eggs of lice hatch in four to sixteen days and the young will mature in seven or eight days. The female insect may lay from fifty to three hundred eggs over a period of from twenty to thirty days and the only satisfactory method of controlling lice is through careful medical examinations by doctors. As most ship men know, equal parts of kerosene and olive oil applied at night and followed by a good scrubbing with soap and water in the morning, will turn the trick.

Fleas lay small white eggs which fall on the floor or ground and hatch in two to twelve days into white larvae or worms. These tiny worms change into mature fleas in from seven to twenty days. Because of the rapidity with which they multiply, fumigation is helpful only as a control measure. If some fleas are brought on board after fumigation, they increase pretty rapidly unless kept down by other methods. Proper fumigation kills not only the live fleas but also the eggs and larvae.

Bedbugs lay white, oval eggs, six to fifty at a time. The young bedbugs are full grown in thirty-five to forty-eight days. Unless cyanide is used full strength, at more than double the dosage ordinarily used for rats, the eggs of the bedbugs, as in the case of the cockroaches, are not killed.

A good many ship operators have an idea that cyanide will not kill the eggs of cockroaches or bedbugs. That they can be destroyed has been well demonstrated again and again. Professor E. O. Essig, entomologist of the University of California, who has had many years experience with cyanide, states that there is no reason why the fumigation of ships cannot be carried out at almost no added expense, in such a way as to destroy practically all the eggs.

C. E. Rice, in a publication of the United States Public Health Service, says that the authorized formulas used by the Service in fumigating ships will kill all the live insects as well as the eggs. It may occasionally happen that fumigation is carried out when a very high wind is blowing or on ships where it is difficult to get the quarters gas-tight. Under such circumstances there may be a little difficulty in killing the eggs.

All fumigation should be regarded as a method of control. It is impossible to eradicate any of the pests mentioned by fumigation or any other method, for the simple reason that they are constantly being brought on board ship from many sources. If fumigation is properly done, however, passenger ships are freed from a very serious sort of nuisance to passengers and other vessels provide very much more satisfactory living conditions for their crews. In addition, valuable cargoes are often saved from damage.

The United States Public Health Service estimates that the cost of cyanide materials in sufficient quantities to kill cockroach eggs is only a few cents per thousand cubic feet. The present charges made by the government approximate 40 cents to 45 cents per thousand cubic feet. This shows that the main charge is for labor and overhead and even doubling the cost of materials would add very little to the cost of fumigation.

Marine Insurance

Edited by JAMES A. QUINBY

Times Haven't Changed Much

THROUGH the courtesy of our good friend Jack Waddington, secretary of the Board of Marine Underwriters of San Francisco, we have been allowed to examine a very interesting example of the handwork of Thomas N. Cazneau, an adjuster whose name trails with many a flourish across the pages of California's early maritime history. The adjustment is dated February 16, 1865, and deals with the general average suffered by the British ship Ansel on a voyage from Greenwich, Scotland, to San Francisco.

The statement is done entirely in long hand and is beautifully executed, the carefully shaded strokes and illuminated title pages surpassing anything the modern age of machinery can produce.

From the narrative we learn that the good ship Ansel, J. A. Spedden, master, encountered heavy weather during the month of June, 1864, which caused her to spring a leak. She was put off her course and run into lower latitudes, where better weather was found, and certain minor repairs effected while at sea. Upon encountering further heavy weather, tempestuous seas and severe gales (all of which are underscored in red ink) the Ansel was forced to put into the Falkland Islands as a port of refuge and effect repairs.

The mechanics of the adjustment are very similar to those of modern statements, and most of the items included in the general average column would be paid today if Thomas N. should come back to life and submit his case to the Committee. There are one or two things in the adjustment, however, that the present day underwriter would certainly question.

For example, wages and provisions of master and crew are allowed in general average from the time the vessel put off her course to seek lower latitudes until the time she resumed her voyage. With one careless wave of his pen, M. Cazneau thus designates the broad bosom of the South Atlantic a port of refuge.

Interest on disbursements—not including allowances—is inserted at the rate of 10 per cent, which is stated as the legal rate in San Francisco at that time. The legal rate nowadays is 7 per cent, which shows that times have improved in some degree.

The adjuster allowed but three months to collect the general average, which, considering the means of communication of that day, seems a trifle optimistic.

"Merchant's Commission" for collecting general average is allowed at 7½ per cent. It was not until some time later that the newly formed Board of Marine Underwriters of San Francisco was successful in having this ratio of velvet reduced, on the Pacific Coast, to its present figure, namely, 5 per cent on the first ten thousand, 2½ per cent on the next twenty thousand, and 1 per cent on the remainder.

A careful analysis of the various fees charged for adjusting fails to show any radical deviation from modern practice. M. C. Harrison, a recent contributor to these columns, estimated that the adjusting cost of a present day general average constituted a 30 per cent surcharge on the actual loss. In his calculations, based upon a series of statements, he included in adjusting cost such items as adjuster's fees, commissions, printing, interest on funds, etc., and excluded survey fees. Treating the Ansel case in the same manner, we find that the adjusting cost came to a fraction over 29 per cent of the actual loss.

Times haven't changed very much, after all.

BONDAGE

"Whooish-Whooee,"
Said the sea
To me.
"You think you are buried in books, Egad,
And mechanical jiggers
With columns of figgers
To keep me out of your thoughts, my lad,
But don't you see
That can never be
So long as the books are open to me
And salt laden breezes, unbidden and free
Speak of me?"
Said the sea,
"Whooish-Whooee."

"Whooish-Whooee,"
Laughed the sea
At me.
"You're a-breathin' the dust-laden air of the town,
But all of the while
As in land lubber style
You're pickin' 'em up and puttin' em down,
Your soul is mine
To pickle in brine
And bleach on the sands of memory.
This guy Mephisto has nothing on me.
Whooish!" said the sea,
"I chortle with glee,
Who-o-o-o-e-e!"

J. A. Q.

"Underwriters"

(With apologies to the chap who wrote the same thing about men, and Rotary Clubs, and bow ties.)

Oh! How I hate underwriters!

There's the underwriter who issues every loss check "without prejudice." Not that it means anything, but you never can tell.

And the bozo who magnanimously pays a small loss and then, when a big one of the same kind comes up, says, "Oh, it's not the sum involved— It's the principle of the thing."

And the underwriter who is my wife's brother.

And the gink who has the superior young man in the front office who never recognizes me.

And the underwriter who hands me a check for a loss and says, "Now, Morton, there's no liability on the company at all. We're just paying you as a gift, because you're such a friend of ours."

Oh! How I hate underwriters.

But if I were one of 'em I'd undoubtedly act the same way.

Arthur M. Brown **EDWARD BROWN & SONS** *Arthur M. Brown, Jr.*
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The Willdomino Deviation

THE British steamer Willdomino sailed from Marseilles in June, 1920, bound for New York via Gibraltar and Lisbon. About a year ago, she arrived at the Supreme Court of the United States, with conflicting clearance papers from the District and Appellate Courts of the Third Circuit, and laden on the under deck with a general cargo of embarrassing legal problems, most of which the Supreme Court has deftly sidestepped in its decision handed down on January 3 of this year, and reported in 1927 A. M. C. 129.

It seems that the Willdomino left Lisbon for New York with insufficient bunkers and, after a few days, altered her course for North Sydney, Nova Scotia, where more coal was secured. Between North Sydney and Halifax, the vessel struck a submerged reef and the resultant entrance of seawater damaged the cargo.

The District Court in New Jersey (1923 A. M. C. 629) absolved the ship from blame for cargo damage, holding that the putting in to North Sydney was not far enough off the great circle track to constitute a deviation, and that the coal market was so precarious in 1920 that the arrangements for bunkering at North Sydney were reasonable.

The Circuit Court of Appeals for the Third Circuit reversed this decision (see 1924 A. M. C. 889), asserting that the Willdomino had deviated; that she was unseaworthy in that she had left Lisbon without a 25 per cent surplus of fuel; and that if the vessel-owner fails to meet the burden of due diligence to make the vessel seaworthy imposed by Sec. 3 of the Harter Act, he is liable for damage to cargo resulting from negligent navigation or management.

Supreme Court Relies on Deviation

The appeal to the Supreme Court was eagerly watched by maritime interests, and particular attention was directed at the last point mentioned above, since the necessity for the element of casual connection in such cases had been a matter of disagreement in the lower federal courts for some time.

The high tribunal, however, handed the anxious relatives a prize package by affirming the Circuit Court of Appeals solely on the ground that the ship had committed an unwarranted deviation.

"Nothing in the present bills of lading," says the court, "suggests that the vessel might wander about the sea, heading first for one port, and then without adequate reason for another. If the Willdomino had the privilege of going from Ponta Delgado to North Sydney, and intended to do so, it was her duty to take the ordinary course. This she did not do.

"What has been said of the second question renders it unnecessary to discuss the third." (The third, of course, was the casual connection point.)

The Institute Cargo Clauses

WE HAVE been very much interested in the 1926 Report of the Institute of London Underwriters, which has just come to hand. As the Institute Cargo Clauses are standard coverage in the Pacific Coast market, any comment or amendment sponsored by the Technical and Clauses Committee of the Institute merits great weight.

On Page 8 of the report, we note the following:

Institute Cargo Clauses. Clause 9

It having been held by the House of Lords in the case of Muller & Co. vs. L'Union Maritime de Paris and others that the "Memorandum" in Lloyd's policy is inapplicable to goods in a warehouse, it was thought desirable to take counsel's opinion as to the effect of the Judgment on the interpretation to be placed on the Institute Cargo Clauses in respect of the risk on goods whilst on land. In view of the opinion received it was deemed desirable to amend the Institute Cargo Clauses F. P. A. and the Institute Cargo Clauses W. A. with the object of making it clear to the assured that when covering goods F. P. A. it is Underwriter's intention that the goods should be so covered throughout the whole period covered by the policy and that when a policy is issued on With Average Conditions the goods are covered "With Average" during the whole period at risk.

The Technical and Clauses Committee having given the matter careful consideration recommended that a suitable method of altering the clauses to give effect to this intention would be to add the words "This warranty shall operate during the whole period covered by the policy" at the end of the F. P. A. Clause (Clause 9) of the Institute Cargo Clauses F. P. A., and at the end of the Average Clause (Clause 9) Institute Cargo Clauses W. A.

The recommendation of the Technical and Clauses Committee was approved by Liverpool and London Company Underwriters and Lloyd's Underwriters, and the Institute Cargo Clauses will be amended accordingly as from the 1st of January 1927.

Clause 9 of the Institute Cargo Clauses F. P. A. will therefore read as follows:

"Warranted free from Particular Average unless the vessel or craft be stranded, sunk, or burnt, but notwithstanding this warranty the assurers are to pay the insured value of any package or packages which may be totally lost in loading, transshipment, or discharge, also for any loss of or damage to the interests insured which may reasonably be attributed to fire, collision, or contact of the vessel and/or craft and/or conveyance with any external substance (ice included) other than water, or to discharge of cargo at port of distress, also to pay landing, warehousing, forwarding, and special charges if incurred for which Underwriters would be liable under a policy covering Particular Average. This Warranty shall operate during the whole period covered by the policy."

A similar addition is made to the W. A. clauses, the addition, of course, consisting simply in the tacking on of the final sentence.

Linked up with the Warehouse to Warehouse Clause, the amendment makes clear the intent of the underwriter to be liable only under his F. P. A. franchise or warranty, even

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though the loss take place after discharge. The change was made upon the advice of counsel, who expressed the fear that the Institute Clauses might receive the same unceremonious treatment as the Memorandum Clause, if the House of Lords got hold of it.

At the same time, counsel were asked whether the ejusdem generis rule applied to the land portion of a risk covered under a policy containing the Waresouse to Warehouse Clause, and the opinion expressed was that the ejusdem generis rule does apply to the land portion as well as the marine portion, but that the extension of the policy to land risks is a very limited one, the specific risks which apply equally to sea and land being fire, thieves, or enemies.

Comment as to the ejusdem generis rule is more or less historical in its nature. The rule was early limited so as to be practically inoperative, and to all intents and purposes, might just as well be left out of the policy. And as for the perils covered under the Warehouse to Warehouse Clause, we suggest that our good friends the Institute Underwriters might devise some wording which would put an assured upon notice of the extremely limited nature of his coverage thereunder. Assailing thieves or enemies might attack a warehouse—but in our brief span of memory, fire is the only peril that has caused much worry. We offer a leather bound book of return premiums to the man who will devise some way of saying to the assured, "Yes, we cover your goods to the warehouse, but it means very little, since fire is about all we cover on land."

Marine Bodies Start New Year

THE marine underwriters of San Francisco are not embarrassed by conflicting interests in their social and business organizations, for the simple reason that these interests are considered of sufficient importance to demand separate organizations. The Board of Marine Underwriters of San Francisco is a cooperative group of underwriting companies and is organized for purely business purposes, while the Association of Marine Underwriters of San Francisco is composed of individuals and has developed a field of endeavor which is partly social and partly educational.

Both of these organizations have recently held annual meetings to inaugurate the season of 1927. At the annual meeting of the Board of Marine Underwriters held on Tuesday, February 8, Harry Pinkham, marine manager of J. B. F. Davis & Son, was elected president for the ensuing term, and S. A. Livingston of Matthews & Livingston was elected vice-president. Jack Waddington, the general secretary, entered upon his duties for another term.

The Association of Marine Underwriters held its forty-second annual meeting on January 29, the occasion being marked by a banquet at the Commercial Club. Officers for the coming year were elected as follows: L. G. Haefner, Fireman's Fund, president; George Ismon, Phoenix of London, vice-president; T. K. Hannum, Insurance Company of North America, secretary; C. W. Jones, Home Insurance Company of New York; F. A. Jansen, Parrott & Co.; and S. A. Livingston, Matthews & Livingston, executive committee.

According to some of the old timers present the banquet was a greater success than any held in recent years, not excluding those prior to 1920. There was entertainment of a high order and a varied and satisfying array of those things which appeal to gustatory epicures. A feature of the evening was a burlesque purporting to show the inner workings of the adjustment committee, during the course of which many high and mighty members of the marine community had their reputations roughly handled.

Isherwood and Bracketless

IT IS only necessary to take a casual glance at the table of annual records given below to fully appreciate the important bearing that the Isherwood System has had upon the shipbuilding industry, and proof of the continued confidence placed in same is amply provided by the results for the year 1926.

Year.	Number of ships built or under construction.	Deadweight carrying capacity.
Sept. 1907 to Dec. 1908	6	31,608 Tons
1909	36	212,992 "
1910	76	484,752 "
1911	140	958,795 "
1912	240	1,777,348 "
1913	270	1,993,034 "
1914	311	2,351,322 "
1915	468	3,548,221 "
1916	620	4,666,000 "
1917	800	6,332,150 "
1918	1050	8,707,700 "
1919	1260	10,594,700 "
1920	1395	11,962,400 "
1921	1418	12,032,400 "
1922	1431	12,101,890 "
1923	1443	12,174,490 "
1924	1472	12,408,700 "
1925	1502	12,649,730 "
1926	1551	13,096,480 "

The outstanding feature of interest in connection with this year's contracts is the progress made by the Bracketless System, and it is nothing short of remarkable that in six months after the completion of the first vessel twelve contracts have been placed making a total of 14 ships aggregating about 180,000 tons deadweight carrying capacity. This wonderful adoption of the Bracketless System, together with its close alliance to the Isherwood System, is sufficient justification for the statement that the unique advantages offered to shipowners and shipbuilders alike through the elimination of bulkhead brackets in oil tanker construction cannot fail to have any other effect than to revolutionize shipbuilding for this particular type of vessel, just as the Isherwood System had done prior to the advent of the Bracketless System.

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INSURANCE

BROKERS FOR THE ASSURED—AVERAGE ADJUSTERS

Freights, Charters, Sales

February 21, 1927.

SINCE our last report dated January 21, the following steamers have been reported fixed with grain to the U. K. Continent: British str. Dalworth, 39/-, Feb., Strauss & Co.; British m.s. King Malcolm, 40/9, Feb., same charterers; Japanese str. Naples Maru, 36/3, option Puget Sound or Columbia River 37/6, Feb., Kerr Gifford & Co.; a steamer, 3 ports Mediterranean, 40/3, Feb.; Japanese str. Iwatsan Maru, Mediterranean, Feb., Strauss & Co.; British str. Selviston Maru, Feb. Canadian American Shipping Co.; British str. Fishpool, 35/6, option Prince Rupert, 36/3, Mar., Wm. H. Pymm, Jr.; Japanese str. India Maru, 36/3, Mar., Kerr Gifford & Co.; British str. Bridgepool, 39/6, two ports, Ed. L. Eyre & Co., Mar.; Japanese str. Yaye Maru, 36/8, Mar., Canadian Cooperative Wheat Producers; British str. Simonburn, 36/3, Mar., Canadian American Shipping Co.; British str. Turkesan, 36/3, Mar., Kerr Gifford & Co.; British str. Oakworth, 37/-, option Portland 38/3, Mar., Strauss & Co.; Japanese str., 37/3, option Vancouver 36/-, Apr., Balfour Guthrie & Co.; Japanese str. Sweden Maru, 37/6, option British Columbia, 36/3, Mar., Kerr Gifford & Co.; Japanese str. Denmark Maru, 37/3, option British Columbia 36/-, Apr., Balfour Guthrie & Co.; British str. Teespool, 40/- one port, 41/3 two ports, Mar., Westrope & Co.

The Japanese str. Seine Maru is reported fixed from Prince Rupert to Shanghai, January loading, by Canadian Cooperative Wheat Producers and Japanese str. Yomei Maru, $5, Feb.-Mar., same charterers.

The following fixtures are reported for lumber to Australia: Japanese str. Tohkom Maru, Feb.; Panama m.s. Aneiura, $14.50, prompt, J. J. Moore & Co.; American sc. K. V. Kruse, $14.50, May-June, Balfour Guthrie & Co.; Weir str, $14.50, Mar., J. J. Moore & Co.

The following steamers are reported fixed with lumber to the Orient: Japanese str. Koyo Maru, Shanghai, $10.50, Feb., Pacific Export Lumber Co.; Japanese str., North Pacific to Japan, Mar., H. R. MacMillan Export Co.; Japanese str., same, Mar./Apr.; Japanese str. Choyo Maru, $10.25 same; Japanese str. Ishin Maru, $9.25, Feb., Japanese str. Havre Maru, Mar., Yamacho & Co.; Japanese str. Milan Maru, Mar., Nakagawa & Co.

For lumber to the Atlantic, the following fixtures are reported: Japanese str., British Columbia to North of Hatteras, $13.50, Feb./Mar., Canadian American Shipping Co.; American str. Corsicano, Puget Sound to Cuba, Feb., Foster Wyman Lumber Co.; American str. Henry D. Whiton, North Pacific to New York, Mar., A. C. Dutton Lumber Co.; American str. Onondaga, Grays Harbor to New York, Feb./Mar.

The American str. San Pedro is reported fixed with lumber and ties from Eureka to San Jose de Guatemala and La Union, Jan. loading, by Hammond Lumber Co.; the American str. Edna Christenson, berthed Portland and San Francisco to Buena Ventura direct, Feb. loading, by J. E. Davenport, and the American str. Bert E. Haney, from Puget Sound to Maracaibo, Feb./Mar., by Schwager, Karlin Lumber Co.

The following steamers are reported taken on time charter: British str. Harold Dollar, San Francisco to Australia and return, $1, Mar., J. J. Moore & Co.; Norwegian str. Herakles, Pacific trade; Swedish m.s. Falsterbo, North Pacific trade (continuation), W. L. Comyn & Co.; British str. Robert Dollar, one round trip to Australia, 95 cents, Mar./Apr., J. J. Moore & Co.

The following steamers are reported sold: American str. Kermit, and American str. Montpelier, American Shipping Commercial & Navigation Corp. to American-Hawaiian Steamship Co.; American sc. Vigilant, E. K. Wood Lumber Co. to City Mill Co., Honolulu; American strs. Baccarat and Seneca, purchased by Hammond Lumber Co.; American str. Pittsburg Bridge, U. S. Shipping Board to Matson Navigation Co.; American strs. Baccarat and Seneca, sold by Hammond Lumber Co. to Japanese parties, delivery Japan; American ship Tonowanda, Columbia River Packers Assn. to J. J. Moore & Co.

PAGE BROTHERS, Brokers.

A New Type Barge

The new 90-foot barge to be built by the Hanlon Shipbuilding & Drydock Co. for the Union Oil Company is the first to be fitted to carry hot asphalt. Special steam connections to coils in tanks will be built in, and the asphalt will be handled by two Kinney pumps, engine driven. A more complete description of the arrangements will appear later in Pacific Marine Review.

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G. L. West, Manager
Pacific Marine Dept.

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Marine Uses for Haskelite and Plymetl

AN ARTICLE published recently in "Industrial Marketing" by James Raymond Fitzpatrick, secretary and director of sales of the Haskelite Manufacturing Corporation, Chicago, describes as follows the various uses of Haskelite and Plymetl on shipboard.

Bulkheads separating staterooms on passenger vessels, ocean, river, and lake, were usually made of lumber in a tongue and groove construction, like a ceiling, with two layers laid at right angles to each other, and at an angle of 45 degrees to the floor. These bulkheads were covered on each face with a composition board. This type of bulkhead is heavy, too thick, and expensive. Our tests proved that a Haskelite bulkhead would be stronger, lighter in weight, of better appearance, and more economically installed, because furnished in the exact sizes required for the opening. In fact, it could be made of one piece to cover the entire side of a stateroom. It could be painted more economically. It was only 3/4 to 7/8 inch thick and therefore more economical as to space. This last point alone would permit the addition of several staterooms to each deck, because of its use in place of the old style bulkheads.

With all of these advantages in its favor, Haskelite was promptly accepted as the new type of bulkhead by the shipbuilding field, which also accepted Haskelite for ceilings and the interior decorative work of parlors, dining halls and salons.

The result can be stated best by mentioning that since its introduction in this field, practically 85 per cent of all new and reconditioned vessels on the Atlantic Coast, the Great Lakes, and the Hudson and Delaware rivers have used Haskelite. It was used on the Leviathan, George Washington, and all the United States Lines' vessels, the large lake liners, City of Detroit and City of Cleveland III, the Merchants and Miners boats, two Norfolk & Washington boats, and many others.

The Haskelite Manufacturing Corporation brought out a new panel material consisting of Haskelite plywood with a metal face. The metal best adapted for this use is Monel. Monel Plymetl makes an ideal material for serving table tops, for bath rooms, bulkheads, and for many uses aboard ship where a smooth noncorrosive metal surface is desirable.

The metal face of "Monel-Plymetl" gives Haskelite superior resistance to weather, rust and wear. The corrosion-resisting properties of Monel Metal combined with the advantages of Haskelite results in a stiff, light metal surface, highly resistant to chemical reaction and physical abrasion. The use of a special glue enables the Haskelite Manufacturing Corporation to apply Monel Metal faces firmly to the sanded, smooth surface of Haskelite ply-wood panels. Before "Monel-Plymetl" was placed on the market, it was tested very thoroughly both by exposure to all sorts of weather and vibration. "Monel-Plymetl" was exposed to the action of the sun, rain and cold without the material showing any sign of deterioration.

Like Haskelite, "Monel-Plymetl" has a large number of uses. "Monel-Plymetl" can be cut with an ordinary band saw; it can be formed and riveted hot or cold; rendering the panel adaptable to various types of construction. It is interesting to note that tests indicate a 5/16-inch rivet will support a load of more than 2000 pounds before failure, and a 3/8-inch rivet over 3000 pounds.

Plymetl is also used in place of steel in crews' quarters, wash-rooms, and many places below deck. On one Hudson river boat, the steamship Bear Mountain, Plymetl is used practically inside and out.

Haskelite and Plymetl now are being generally adopted on Pacific Coast vessels. In the City of Honolulu, now being reconstructed by the Los Angeles Shipbuilding & Drydock Corp. from the old President Arthur, 54,294 square feet of Haskelite are being used for bulkheads, paneling, etc.. In the two Key System ferries being built by The Moore Dry Dock Company, 5451 square feet of Plymetl is used for life preserver racks, and 16,110 square feet of Haskelite for seats. Among a number of smaller craft building on the West Coast that have used Haskelite or Plymetl is a pleasure craft recently completed by John Twigg & Sons, San Francisco, for O. H. Harrison, which includes Haskelite bulkheads.

Bernard Mills, Marine Superintendent

A QUIET, dignified, and pleasant man is Bernard Mills, marine superintendent for the American-Hawaiian Steamship Company, with offices at Pier 28, San Francisco. As a marine engineer Mr. Mills ranks among the best in America. For a quarter of a century he has worked under the A-H house flag, and the efficiency of the engine plant on the American-Hawaiian fleet is sufficient testimony to the ability of the master hand at the throttle.

A native of Maryland and descended from one of the oldest families of the Old Colony State, after completing his school days, Master Mills was entered as an apprentice on marine engine work with the old firm of Charles Reeder and Sons, Baltimore. This establishment made a specialty of engine and hull building for side-wheel and small propeller vessels, giving young Mills a splendid chance to learn much marine engineering and naval architecture. After learning his trade as a machinist, he took up naval architecture, as he believed that to be a successful marine engineer one should also understand hull design and construction.

In his studies he became associated with the late V. F. Lassoe, who for many years was marine superintendent and advisory engineer for several companies in the East. During the Spanish-American War Mr. Mills served as an engineer officer in the U. S. Navy. In 1901 he made his first trip to San Francisco as first assistant engineer of the old Hawaiian, and was soon after promoted to chief engineer of other vessels, from which he advanced to port engineer and marine superintendent with headquarters at New York. Shortly after the late war Mr. Mills was sent to Germany to attend to the completion of the two steamers Resolute and Reliance, built in Hamburg for the United American Line, which was at that time combined with the American-Hawaiian interests. While with the United American Line Mr. Mills was a busy man, as some one hundred and twenty-five vessels were being operated, with as many as ten sailings a day.

About four years ago the headquarters of the American-Hawaiian Steamship Company were moved to San Francisco, and Mr. Mills was given the position of marine superintendent at that port.

Mr. Mills is a member of and takes an active interest in the American Society of Mechanical Engineers and the American Society of Naval Architects and Marine Engineers. Since his residence in California he has made many friends both in business and social circles. Most marine engineers have a hobby. That of Mr. Mills is gardening. He has a beautiful home at Berkeley, where he grows many rare varieties of beautiful flowers that are a delight to his neighbors and to himself.

WORTHINGTON PUMP BUYS HARRIS AIR PUMP COMPANY

Announcement is made by the Worthington Pump and Machinery Corporation of the purchase by it of the Harris Air Pump Co. of Indianapolis, for some years one of the foremost manufacturers of air lift systems and air lift pumps. The purchase was outright and includes patents, drawings, patterns, and good-will.

This new acquisition places Worthington in the front rank in the air lift industry as it permits the company to offer complete well equipment, including compressor, produced in its own plants.

American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Shipbuilding Work in Prospect

BIDS ASKED ON MOTOR TANKERS

The Standard Transportation Company, 26 Broadway, New York, has sent out plans and specifications to Atlantic Coast shipyards asking bids for the construction of three motor tank vessels. The tankers are to be 489 feet long, 62 feet 6 inches beam, and 29 feet 3 inches loaded depth, of 13,400 tons deadweight carrying capacity. The vessels are to be built on the Isherwood system of longitudinal framing. The specifications provide for bids to be submitted on the installation of any of the accepted types of diesel engines.

The shortage of tank ships in world commerce and the extensive building contracts let to foreign yards bring some hope that the order for these vessels will be placed in an American yard.

BIDS ASKED ON CRUISERS

The Navy Department, in the person Curtis Wilbur, Secretary, will open bids at Washington on March 10 for the construction of Light Cruisers C126, C127, and C128, for which funds have been appropriated. The cruisers will be steam turbine driven, of 10,000 tons displacement. Separate bids for hull construction and turbines and gears are to be submitted. Wm. Cramp & Sons Ship & Engine Building Company, Philadelphia, is now building the cruiser Salt Lake City complete and machinery for the Pensacola, both sister ships of the cruisers abovementioned.

The Mare Island Navy Yard is to have an opportunity to bid on the hull construction of Cutters Nos. 45, 46, and 47, soon to be requested by the Coast Guard Service.

I. M. M. PLANS TWO SHIPS

Captain Roger Williams, operating manager for the International Mercantile Marine Company, recently visited the California offices and dock facilities of the Panama Pacific Line. The object of his visit was to inspect the facilities for handling the liner California at San Francisco, Los Angeles, and San Diego, and to judge the prospects for growth of passenger and freight business between New York and California. During his stay, Captain Williams announced that it is the intention of the I. M. M. to build two additional liners similar to the California for this service.

CANADIAN YARDS MAY GET ORDERS

It is reported that the Canadian Government Merchant Marine is planning the construction of five passenger and freight liners for their West Indies trade. It is also further reported that it is possible that three of these vessels will be built in Canadian yards. The business would be very welcome to the shipbuilding plants on the St. Lawrence, as there has been a tendency of Canadian interests towards placing orders for ships in British yards rather than patronize home industry.

RECONDITIONING OF AMERICA AUTHORIZED

The Emergency Fleet Corporation was authorized on February 3 by the Shipping Board to prepare an advertisement for bids contemplating the reconditioning of the steamship America, which was severely damaged by fire at Newport News, last March.

The purpose of putting this vessel into condition, it was stated orally at the office of the board, is that it may be operated as a component of the United States Lines. The America is a cabin ship of 22,622 gross registered tons. The board desires that the vessel be ready for service this summer.

CONVERSION SPECIFICATIONS OUT ON THREE SHIPPING BOARD VESSELS

The Department of Maintenance and Repair of the Emergency Fleet Corporation, New York, recently issued specifications for the conversion to motorships of the steamers Yomachichi, Seminole, and West Grama, in pursuance to the Conversion Program of the Shipping Board. The Yomachichi and Seminole are sister ships, being 416 feet over-all, 54 feet molded beam, and 33 ft. 9 in. depth, with a gross tonnage of 5950. The West Grama is slightly longer but of less depth, measuring 5424 gross tons.

The Yomachichi will be equipped with diesel engines manufactured by the Busch-Sulzer Bros. Diesel Engine Co., of 3000 brake horsepower, being 6-cylinder, 2-cycle, single-acting type and giving a speed of 11.6 knots.

The Seminole will be equipped with 3300 horsepower diesel engines manufactured by the Hooven-Owens, Rentschler Company, being of the 4-cylinder, 2-cycle, double-acting type. A speed of 11.9 knots is anticipated.

The West Grama will be equipped with 4-cylinder, 4-cycle, double-acting McIntosh & Seymour engines of 2700 brake horsepower, which will give her a speed of about 11 knots.

The bids for conversion of these vessels will include all work necessary to provide for the conversion of the vessels, including rearrangement of crew's quarters, provision for passenger accommodations, repairs, renewals, painting, and dry-docking—in fact putting the vessels in condition for immediate sea service. Bids will be opened February 15.

ORDER FOR ENGINES FOR DISTRICT OF COLUMBIA PLACED

The Standard Oil Company (Calif.), with offices in San Francisco, has placed an order with the Busch-Sulzer

USE WYBROCK INDIANA BENDING OAK

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PLANK and TIMBER—also all PHILIPPINE
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—Since 1872

Bros. Diesel Engine Company for the power plant of the tanker District of Columbia. This tanker was purchased by the oil company from the Shipping Board on the condition that it be converted to diesel power.

LARGE REPAIRS STIPULATED IN SALE OF STEAMER

The Shipping Board recently approved the sale of the steamship John Jay to D. K. Ludwig of Boston for the sum of $125,000, on the stipulation that certain repairs at a cost of $260,000 would be performed by the purchaser within a year's time. The vessel is a cargo ship of 12,850 deadweight tons, designed to steam at about 10¼ knots. The ship is to be converted to a bulk ore carrier or tanker at the discretion of the purchaser.

UNION OIL TO BUILD TOW BARGE

The Hanlon Drydock & Shipbuilding Company, Oakland, Calif., was low bidder on bids recently submitted to the Union Oil Company of California, with offices at Los Angeles, for the construction of an oil tow barge.

SHIPPING BOARD TO RECONDITION TANKERS

The shortage of oil tankers for the transportation of oil to the Philippines will probably cause the Shipping Board to recondition the two tankers Tippecanoe and Sepulga, sister ships of about 100,000 barrels' capacity each, which laid up since 1920. Specifications are expected shortly by the shipyards for this work. The tankers will probably be allocated to Struthers & Barry, who now operate four Shipping Board tankers in the Orient trade.

TWO MORE VESSELS SELECTED FOR CONVERSION

It is reported that the diesel engines building at the Pacific Diesel Engine Company, Oakland, Calif., for the Shipping Board's conversion program will be installed, when ready, in the West Harts and West Hartland, now laid up at Benicia and Seattle. The vessels were built by the Columbia River Shipbuilding Company in 1919.

COLUMBIA RIVER CRAFT TO BE BUILT

Order has not yet been placed by the Harkins Transportation Company, Portland, Oregon, L. O. Hosford, president, for an express day passenger and freight vessel for operation on the Columbia River between Astoria and Portland.

As planned, the vessel will be 185 feet long, 32 feet beam, and 10 feet depth. Turbo-electric or diesel-electric propulsion will be employed, to give the craft a speed of about 14 knots. Every convenience and comfort for travelers will be provided for, and considerable space devoted to the accommodation of express freight. The vessel will be equipped with a freight elevator for the quick handling of cargo at the river wharves .

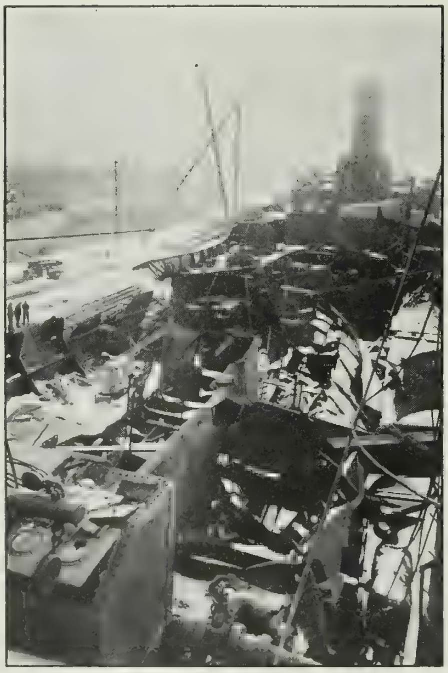
PLANS READY SOON FOR TUG

A 65-foot tugboat for George A. Roberts is being designed by the Seattle naval architects Lee & Brinton, Inc. The vessel is to be built on Lake Washington and is to be equipped with an 80-horsepower engine and boom and hoisting gear for brailing. The boat will be used for cannery purposes.

TODD PLANT GETS AGWISUN CONTRACT

The tanker Agwisun, sunk during an explosion in Brooklyn last year, was raised recently and towed to the Robins plant of the Todd Shipyards Corporation to whom the contract for the repairs has been awarded.

Survey of the vessel showed that the entire ship, from the amidships quarters to the boiler room casing aft, had been practically destroyed. The back of the vessel was broken and she was drawing 13 feet forward, 19 feet aft, and 24 feet amidship. Temporary repairs had to be made before it was possible to move her.



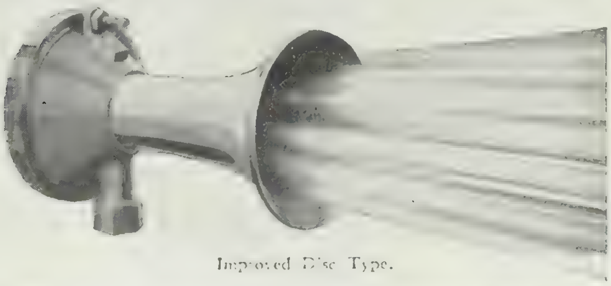
To float the vessel to a draft that would permit her to be dry docked was unusually difficult, as it was feared that, owing to her weakened midship section, should she be pumped out too far amidships she would crack and break the other way, dropping her stem and stern deep down and leaving amidships light. To prevent this heavy steel hawsers were stretched from her forecastle head, over the bridge, to the poop deck and a heavy channel was secured on the starboard side across the break. Huge gaps in the tanker's sides were covered with heavy rope mats and canvas wedged under steel wires that had been stretched for the purpose. These patches were necessarily flexible to permit the working of the ship as she was pumped out.

REPAIR AWARD

The Albina Marine Iron Works, Portland, Oregon, was low bidder for a new stern frame to the steamer West O'Rowa, on February 13, submitting a bid of $15,860. The West O'Rowa is a Shipping Board vessel operated out of the Columbia River by the Columbia Pacific Shipping Company of Portland.

CUNNINGHAM

MARINE AUXILIARY EQUIPMENT



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STEAMSHIP EVANGELINE LAUNCHED

The steamship Evangeline of the Eastern Steamship Lines, Inc., was launched on February 12 at the yard of Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia. Miss Betty Dumaine, daughter of Mr. and Mrs. F. C. Dumaine of Concord, New Hampshire, sponsored the boat.

The Evangeline, when completed, will inaugurate a new passenger steamship service out of New York to Yarmouth, Nova Scotia. The Eastern Steamship Lines are already engaged in the passenger and freight service from Boston to New York, operating the steamers Boston and New York, and from New York to Norfolk, operating the George Washington and Robert E. Lee. The Evangeline is a sister ship of the Yarmouth, launched last November, which will be employed in the Boston-Yarmouth service.

The Evangeline, like the Yarmouth, is of 5880 tons displacement; is twin-screw and turbine-driven, burning oil fuel; length 378 feet; breadth 55 feet; depth 29 feet, with five decks, the upper three being devoted to passenger accommodations. A special freight deck is provided for motor cars.

Public rooms include two social halls, a library, writing room, lounge room, music room, dancing saloon, smoking room, veranda cafe, and glassed-in promenade deck. Accommodations are provided for 750 first-class passengers.

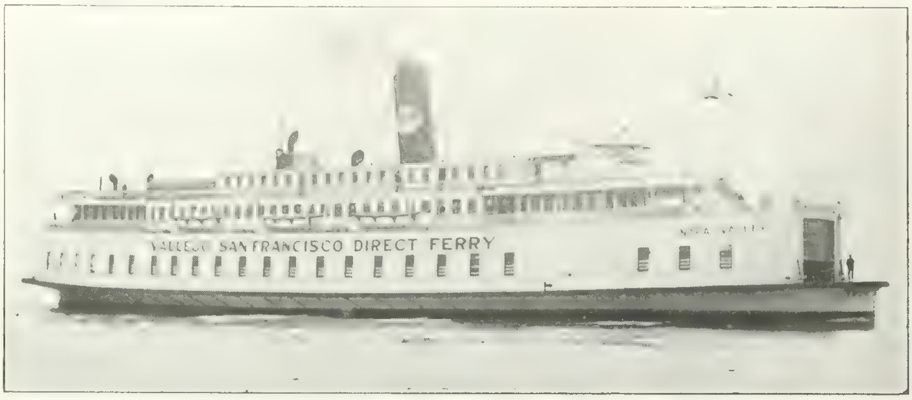
PATROL BOAT LAUNCHING

American Brown Boveri Electric Corporation launched seven Coast Guard Patrol boats on January 27 at their Camden, New Jersey, plant. These vessels are similar to the six launched on November 30 and are part of the Government contract for thirty-three.

Cmdr. Horatio Nelson Woods of the Coast Guard, who has been in charge of construction, was present, as were District Commander M. W. Rasmusson, of Washington, and a number of other officers of the Coast Guard.

TODD PLANT FINISHES IMPORTANT JOB

The Todd Dry Docks, Inc., at Seattle, completed the improvement and alteration of the steamship Mary D. of the Pacific American Fisheries the latter part of January. The vessel was formerly the Pansa, purchased from the Shipping Board, and was converted by the Todd plant from a two mast to a four mast cargo carrier and her deck and holds remodeled to provide for the handling of piles and lumber between the ports of Puget Sound and the companies' salmon packing plants in Alaska. The total lumber carrying capacity is about 4,000,000 feet. Improvements to crew's quarters and general equipment were also carried out, including a new type of radio direction finder installed by the Radio Corporation of America.



Steamer Napa Valley of the Monticello Steamship Company.

BAY FLEET EQUIPPED TO CARRY AUTOS

The Monticello Steamship Company, operating passenger and freight service on San Francisco Bay between San Francisco and Vallejo, has taken advantage of the winter slack season to carry out a program of improvement on their steamships Napa Valley, Calistoga, and City of Sacramento. The great increase in automobile travel from San Francisco to various points in northern California has caused this company to refit its vessels to carry vehicles, and the accompanying illustration shows the manner in which the bow and stern have been remodeled to permit the easy handling of automobiles on and off the wharves. The entire main deck of each of these steamers has been given over to the automobiles. The dining room has been placed below deck and the general passenger saloon on the upper deck, together with the smoking room, barber shop, bootblack stand. Eighty automobiles can be carried. The steamers Calistoga and City of Sacramento are larger and have accommodations for 110 automobiles.

The work was carried out at the Potrero Works of the Bethlehem Shipbuilding Corporation at San Francisco. The ships are very fast and make the trip from San Francisco to Vallejo in about an hour and three quarters.

The Grand Trunk car ferry, Madison, was launched January 20 at Manitowoc, Wisconsin, by the Manitowoc Shipbuilding Co. This is a sister ship to the Grand Rapids which was launched in October and is now in operation.

Among the important products used in the construction of these boats was Haskelite for bulkheads, paneling, etc., and Plymetl for doors.

An interesting feature of this launching is that a bottle of milk was used to christen the ship instead of the usual liquid. The Wisconsin Dairymen's Association took a keen interest in the event, furnishing a bottle of milk combining the product of five different breeds in Wisconsin.

RECENT SHIPBUILDING CONTRACTS

Pacific Coast Shipbuilding Company, foot of 14th Street, Oakland, Calif., has an order from the City of Seattle for a triple screw, steel construction fireboat to be powered with gasoline engines.

Prince Rupert Drydock & Shipyards, Prince Rupert, B.C., has an order from M. J. Iverson for a 58-foot halibut boat.

American Bridge Company, Pittsburgh, Pa., has an order from the Iron City Sand and Gravel Co. for 10 barges, 135 by 27 by 7 ft. 6 in.; delivery to be made in March and April.

American Brown Boveri Electric Corp., Camden, N.J., has an order from the Brooklyn Eastern District Terminal for a carfloat to be 340 by 38 by 11 ft. with capacity for 23 cars.

Federal Shipbuilding & Drydock Company, Kearny, N. J., has contract from the Lehigh Valley Railroad for three carfloats 278 by 39 by 10 ft.; they also have an order for three carfloats for the D. L. & W. Railroad.

Nashville Bridge Company, Nashville, Tenn., is building six deck barges for stock.

The Pusey & Jones Corp., Wilmington, Del., has an order for a twin screw diesel yacht from Henry J. Gielow, Inc., naval architect of New York. This is to be the largest yacht ever built in an American shipyard and it is greatly to the credit of the owner and architect that the work is to be done in this country. The yacht will be 294 ft. over-all, 38 ft. 3 in. beam, and 16 ft. loaded draft. Propulsive power will be supplied by two diesel engines developing a total horsepower of 3000.

Staten Island Shipbuilding Co., Staten Island, N. Y., has a contract from the Standard Transportation Co., of New York, for two steam tugs. The tugs will be 100 ft. 2 in. long, 24 ft. 1 in. beam, and 12 ft. 3 in. depth. They will be powered with compound steam engines developing 850 horsepower and giving a speed of 15 knots. Steam will be supplied by one Scotch boiler 14 ft. 9 in. diameter by 12 ft. Delivery is scheduled for August next.

The Charles Ward Engineering Works, Charleston, W. Va., has a contract from the Mississippi River Commission, Dredging District, Memphis,

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Tenn., for a diesel stern-wheel survey boat. The boat will be 139 ft. 6 in. long by 24 ft. beam, by 5 ft. 3 in. depth.

Peninsula Shipbuilding Company, Portland, Oregon, is building for the Union Pacific System, at a cost of $60,000, an automobile ferryboat for operation between Astoria and Megler, Wash.

Foss Launch Company, Seattle, are building for their own account on their middle-waterway plant, a light draft, diesel powered tugboat for harbor work. The craft was designed by Phillip Thearle, naval architect of Tacoma, and will be 55 feet long 16 feet beam, and equipped with 150 horsepower diesel engines.

American Ship Building Company, Cleveland, has an order from the Michigan Limestone & Chemical Co. for a tugboat to be powered with compound engines developing 900 indicated horsepower, steam to be supplied by a fire-tube boiler at 160 pounds pressure. The tug will be 83 ft. 6 in. long, 24 ft. beam, and 12 ft. draft, having a speed of 12 miles an hour.

This yard also has a contract from the Standard Transportation Company for two bulk oil barges to be 258 feet between perpendiculars, 40 ft. beam, and 10 ft. draft. Keels for all three boats will be laid in March.

Dravo Contracting Company, Pittsburgh, Penn., is starting construction of twenty standard steel barges for stock.

Todd Dry Dock, Engineering & Repair Corp., Brooklyn, has an order from the Department of Plant and Structures of the City of New York for two diesel-electric ferryboats. Nelseco diesel engines of 300 indicated horsepower will be installed. The boats will be 101 ft. 6 in. over guards, 27 ft. 6 in. beam, and 6 ft. 3¾ in. loaded draft.

Hanlon Dry Dock & Shipbuilding Company, Oakland, Calif., has an order from the Union Oil Company of California, Los Angeles, for an oil tow barge.

KEEL LAYINGS

Tahoe, double-end diesel-electric ferryboat for Southern Pacific Co. by Bethlehem Shipbuilding Corp., San Francisco, on Jan. 20.

Six steel motor patrol boats for the U. S. Coast Guard by American Brown Boveri Electric Corp., Camden, N. J., on Feb. 1; three carfloats for Reading Co. during Jan.

Carl D. Bradley, self-unloading bulk freighter for Bradley Transportation Co., by American Ship Building Co. on Jan 10; Harry Coulby, bulk freighter for Pickands, Mather & Co., Feb. 7.

Passenger and freight steamer for Southern Pacific Steamship Lines, New York, by Federal Shipbuilding & Drydock Co., Kearny, N.J., on Jan. 31.

Diesel ferryboat for Tri-State Ferry Co., Cairo, Ill., by Howard Shipyards & Dock Co., Jan. 3.

Two package freighters for Canada Steamship Lines, Ltd., by Midland Shipbuilding Co., Midland, Ontario, Jan. 18.

Duncan Bruce, stern-wheel towboat for W. C. Kelly Barge Line, by The Charles Ward Engineering Works, Charleston, W. Va., Jan. 17.

LAUNCHINGS

Golden Bear, diesel-electric ferryboat for Golden Gate Ferry Co., by General Engineering & Drydock Co., Feb. 2.

Six motor patrol boats for the U. S. Coast Guard by American Brown Boveri Electric Corp. during Jan.

L. E. Black, bulk freighter for Inland Steel Co. by the American Ship Building Co., Feb. 1.

Towboat by Charleston Dry Dock and Machinery Co., Charleston, S.C. (owner not named), Feb. 2.

City of Hamilton and City of Montreal, package freighters for Canada Steamships, Ltd. by Midland Shipbuilding Co., Ltd., Jan. 12.

Grain elevator for Internation Elevator Co. by Staten Island Shipbuilding Co., Jan.

Steel barge for W. C. Kelly Barge Line by the Charles Ward Engineering Works, Dec. 22; W. A. Shepard, towboat for W. C. Kelly Barge Line, Jan. 11.

WM. CORNFOOT, President GEO. RODGERS, Sec'y-Treas.

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DELIVERIES

Five steel motor patrol boats to the U. S. Coast Guard by American Brown Boveri Electric Corp., during Jan.

Five barges to Carnegie Steel Co. by American Bridge Co., during Jan.

PROGRESS OF CONSTRUCTION

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT

Potrero Works, San Francisco

Purchasing Agent: O. W. Streett.

Fresno, hull 5331, double-end diesel-electric vehicular ferryboat for Southern Pacific Co., San Francisco; 256′ L.O.A.; 44′10″ beam; 19′ depth; four Nelseco diesel engines. 450 H.P. each; keel Nov. 8/26; launched Jan. 15/27.

Stockton, hull 5332, sister to above; keel Nov. 20/26; launch Mar. 5/27 est.

Tahoe, hull 5333, sister to above; **keel Jan. 20/27.**

GENERAL ENGINEERING & DRY-DOCK CO.,

Alameda, California

Purchasing Agent: Al. Wanner. ....

Golden Bear, hull 3, diesel-electric wooden auto ferry for Golden Gate Ferry Co.; 240′ L.B.P.; 44′ beam; 11′ 6″ loaded draft; 13 knots speed; 3-400 B.H.P. Ingersoll-Rand diesel engines, direct connected to Westinghouse generators; keel Oct. 28/26; **launched Feb. 2/27.**

Golden Poppy, hull 4, sister to above; keel Nov. 22/26.

Golden Shore, hull 5, sister to above; keel Feb. 5/27 est.

Santa Rosa, hull 6, diesel-electric, steel automobile ferryboat for Southern Pacific Co.; 236′ L.B.P.; 44′ 10″ beam; 12′ 6″ loaded draft; 13 knots speed; 4-450 B.H.P. Nelseco diesel engs. connected to General Electric generators; keel Oct. 28/26; launch Mar. 15/27 est.

J. C. JOHNSON'S SHIPYARD

Port Blakely, Wn.

Kadiak No. 2, hull 94, pile driver scow for Kadiak Fisheries Co., Seattle; 65 by 24 ft.

Hull 95, cannery tender for Sunny Point Packing Co., Seattle; 75 by 17 ft.

Selig No. 1, hull 96, fish scow for Capt. Steve Selig, Ketchikan, Alaska; 60 by 18 by 4ft.

HANLON DRYDOCK & SHIPBUILDING CO.

Oakland, Calif.

Barge for Union Oil Co., Los Angeles.

LAKE WASHINGTON SHIPYARDS.

Houghton, Wash.

Purchasing Agent: A. R. Van Sant.

Cruiser for Stewart Edward White, 58 feet L.B.P.; 65 H.P. Washington-Estep diesel eng.; keel Oct. 11/26.

Fishing boat for Geo. Brown, 65 ft. long; 80 H.P. Worthington diesel engines.

Cannery tender for Libby, McNeill & Libby, Seattle; 75 ft. long; 2-50 H.P. Standard engs.

Fishing boat for Libby, McNeill & Libby, Seattle; 65 ft. long; 65 H.P. Washington-Estep diesel.

Scow for Libby, McNeill & Libby, Seattle; 66 ft. long.

Two river boats for Day, Seattle; ea. 65 ft. long

Two river scows for Day, Seattle; 80 ft. long

Cannery tender for Sunny Point Packing Co.; 50 ft. long; 100 H.P. Hall-Scott eng.

Troller for B. Thompson; 42 ft. long; 27 H.P. Acme eng.

LOS ANGELES SHIPBUILDING & DRY DOCK CORPORATION

San Pedro, Calif.

Barge No. 1, hull 53, oil barge for California & Eastern Oil Co., Los Angeles; 131 L.B.P.; 40 beam; 9-6 loaded draft; 1050 D.W.T.; keel Dec. 27/26; launch Feb. 7/27 est.

THE MOORE DRY DOCK COMPANY

Oakland, California.

Purchasing Agent, Nat Levy.

Peralta, hull 170, double-ended, screw propelled ferryboat for Key System Transit Co.; **256 L.B.P.; 47 molded beam; 21 molded depth; 14.5 normal speed; turbo-electric propulsion; water-tube** boilers; keel May 3/26; launched Oct. 14/26; deliver Mar. 1/27 est.

Yerba Buena, hull 171, sister to above; keel May 3/26; launched Nov. 22/26; deliver Mar. 25/27 est.

Not named, hull 172, diesel-electric, steel, vehicular ferryboat for Southern Pacific Company; 236′ L.B.P.; 44′10″ beam 12′6″ loaded draft; 13 knots speed; 1250 S.H.P. Nelseco diesel engs.; connected to Westinghouse generators; keel Dec. 8/26; launch Mar. 15/27 est.

Not named, hull 173, sister to above; keel Dec. 8/26; launch Apr. 2/27 est.

PRINCE RUPERT DRYDOCK AND SHIPYARDS

Prince Rupert, B.C.

One 75-foot tugboat for Granby Consolidated Mining, Smelting & Power Co.; 120 H.P. Washington-Estep diesel eng.

No name, halibut boat for M. J. Iverson; 58′ L.O.A.

W. F. STONE & SON

Oakland, Calif.

Purchasing Agent: Lester Stone.

No name, motor cruiser, for stock, 36x10x3½ ft.; 12 mi speed; 65-HP. gas engines.

Northern Light, hull 824, yacht for John Borden; 140 L.B.P.; 30 beam; 14 loaded draft; 10 mi. speed; 360 I.H.P. diesel engs.; keel Sept. 1/26; launched Jan. 19/27, deliver May 1/27 est.

Not named, hull 828, yacht for Frank B. Drake; 55 L.B.P.; 13 beam; 6 loaded draft; 7 mi. speed; 30 I.H.P. gas eng.; keel Aug. 25/26 deliver May 1/27 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY

Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Two towboat hulls for Carnegie Steel Corp., Pittsburgh, 149′ 2″ x 33′ 4″ x 5′ 10-5/16″; one delivered.

Six barges for U. S. Engineers, St. Louis, 152x34x7 ft.; 4 keels laid Dec. /26.

Five barges for Wheeling Steel Corp., 140x26x10 ft.

Fifteen barges for Carnegie Steel Co., 175x26x11 ft.; **5 delivered.**

One derrick boat hull for T. Smith & Son, Inc., New Orleans; 110′x50′x10′.

30 coal barges for Carnegie Steel Co.; 175x26x11 ft.

10 barges for Iron City Sand & Gravel Co.; 135 x 27 x 7 ft. 6 in.; deliver March and Apr./27 est.

AMERICAN BROWN-BOVERI ELECTRIC CORP.

Camden, N. J.

Purchasing Agent L. G. Buckwalter

Hull 320, steel motor patrol boat for U. S. Coast Guard, Washington, D.C.; 125 L.O.A.; **23′6″** molded beam, 220 tons displacement; Winton diesel engs.; keel July 26, launched Nov. 26; **delivered Jan./27.**

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Berth 94 San Pedro, Calif.

Hull 321, same as above, keel July/26; launched Nov./26; **delivered Jan./27.**

Hull 322, same as above; keel July/26; launched Nov./26; **delivered Jan./27.**

Hull 323, same as above; keel July/26; launched Nov./26; **delivered Jan./27.**

Hull 324, same as above; keel July/26; launched Nov./26; **delivered Jan./27.**

Hull 325, same as above; keel Sept./26; **launched Jan./27.**

Hull 326, same as above; keel Sept./26; **launched Jan./27.**

Hull 327, same as above; keel Sept./26; **launched Jan./27.**

Hull 328, same as above; keel Sept./26; **launched Jan./27.**

Hull 329, same as above; keel Sept./26; **launched Jan./27.**

Hull 330, same as above; keel Sept./26; **launched Jan./27.**

Hull 331, same as above; keel Sept./26; **launched Jan./27.**

Hull 332, same as above; keel Nov./26.

Hull 333, same as above; keel Nov./25.

Hull 334, same as above; keel Nov./26.

Hull 335, same as above; keel Nov./26.

Hull 336, same as above; keel Nov./26.

Hull 337, same as above; keel Nov./26.

Hull 338, same as above, keel Dec./26.

Hull 339, same as above; keel Dec./26.

Hull 340, same as above; keel Dec./26.

Hull 341, same as above; keel Dec./26.

Hull 342, same as above; keel Dec./26.

Hull 343, same as above; keel Dec./26.

Hull 344, same as above; **keel Feb. 1/27.**

Hull 345, same as above; **keel Feb. 1/27.**

Hull 346, same as above; **keel Feb. 1/27.**

Hull 347, same as above; **keel Feb. 1/27.**

Hull 348, same as above; **keel Feb. 1/27.**

Hull 349, same as above; **keel Feb. 1/27.**

Hull 350, same as above.

Hull 351, same as above.

W. A. Baldwin, hull 355, diesel-electric vehicular ferryboat for Electric Ferries, Inc., New York; 155 L.O.A.; 48'6" beam; 14'4" depth; keel June/26.

Frederick Peirce, hull 356, same as above, keel June/26.

Frank E. Gannett, hull 357, same as above; keel June/26.

Hull 360, barge for Reading Co., 110x32x9.5 ft.; deliver Feb./27 est.

Hull 361, same as above; deliver Feb.27 est.

Hull 364, carfloat for Reading Co.; capacity 10 cars; **keel Jan./27.**

Hull 365, carfloat for Reading Co., capacity 10 cars; **keel Jan./27.**

Hull 366, carfloat for Reading Co., capacity 8 cars; **keel Jan./27.**

Hull 367, carfloat for Reading Co., capacity 8 cars; keel winter /27 est.

Hull 368, carfloat for Reading Co., capacity 8 cars; keel winter /27 est.

Hull 369, carfloat for Reading Co., capacity 8 cars; keel winter /27 est.

Hull 370, carfloat for Brooklyn Eastern Dist. Terminal, 340x38x11ft.; capacity 23 cars.

THE AMERICAN SHIP BUILDING COMPANY

Cleveland, Ohio.

Purchasing Agent: C. H. Hirsching.

Wm. McLauchlan, hull 793, bulk freighter for Pickands, Mather & Co.; 580 L.B.P.; 60 beam; 20 loaded draft; 13 mi. loaded speed; 12,000 D.W.T.; T.E. engs.; 2400 I.H.P.; 3 B. & W. boilers 200 lbs. pressure; keel July 19/26; launched Oct. 7/26; deliver Apr. 15/27 est.

Robert Hobon, hull 794, sister to above keel Aug. 9/26; launched Oct. 30/26; deliver Apr. 15/27 est.

L. E. Black, hull 795, bulk freighter for Inland Steel Co.; 596 L.B.P.; 64 beam; 20 loaded draft; 13 mi. speed; 13,500 D.W.T.; T.E. engs.; 2700 I.H.P : 3 Scotch boilers, 24'6"x11'x185 lbs.; keel Nov. 8/26; **launched Feb. 1/27**; deliver Apr. 15/27 est.

Geo. M. Humphrey, hull 796, bulk freight steamer for Kinsman Transit; 580 ft. L.B.P.; 60 ft. beam; 20 loaded draft; 13 mi. speed; 12,000 D.W.T.; triple expansion engs.; 2500 I.H.P.; 3 Scotch boilers, 14x11; 159 lbs. pressure; keel Oct. 18/26; **launched Dec. 30/26**; deliver April 15/27 est.

Carl D. Bradley, hull 797, self-unloading bulk freighter for Bradley Transport. Co.; 615 L.B.P.; 65 beam; 20 loaded draft; 14 mi. speed; 13,000 D.W.T.; turbo-electric drive; 4000 I.H.P.; 2 water tube boilers; 325 lbs. pressure; **keel Jan. 10/27**; launch Apr. 2/27 est.; deliver July 1/27 est.

Harry Coulby, hull 798, bulk freighter for Pickands, Mather & Co.; 607' L.B.P.; 65' beam; 33' loaded draft; 13 mi. speed; 13,800 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 B. & W. boilers; 200 lbs. pressure; **keel Feb. 7/27**; launch Apr. 23/27 est.; deliver July 1/27 est.

Not named, hull 799, tug for Michigan Limestone & Chemical Co., 83'6" L.B.P.; 24 beam; 12 draft; 12 mi. speed; compound engs. 900 I.H.P.; 1 fire tube boiler, 160 lbs. pressure; keel Mar. 1/27 est.; launch Apr. 9/27 est.; deliver May 1/27 est.

Not named, hull 800, bulk oil barge for Standard Transportation Co.; 258 L.B.P.; 40 beam; 10 draft; keel Mar. 21/27 est.; launch July 13/27 est.; deliver July 27/27 est.

Not named, hull 801, oil barge for Standard Transportation Co., sister to above; keel Mar. 21/27 est., launch July 13/27 est; deliver July 27/27 est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT

Quincy, Mass.

Lexington, hull 1300, airplane-carrier U.S.N., launched Oct. 3/25.

Governor Carr, hull 1401, ferryboat for Jamestown-Newport Ferry Co.; 150'x48'x14'; 703 gro. tons; keel Oct. 11/26.

Hull 1402, carfloat, N.Y., N.H. & Hartford R.R.; 360'x40'x11'6"; 1375 gro. tons; keel July 14/26.

Hull 1403, carfloat, same as above; keel July 15/26.

Hull 1404, carfloat, same as above; keel July 16/26.

Hull 1405, carfloat, same as above; keel July 16/26.

Hull 1406, oil barge for City Service Transport Co. 204'x35'6'x14'3".

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT

Wilmington, Del.

Not named, hull 3511, oil barge for Seaboard Shipping Corp.; 170'x37'x12'6"; keel Oct. 12/26; launch Dec. 22/26 est.; deliver Dec. 29/26 est.

BETHLEHEM SHIPBUILDING CORP., BALTIMORE DRY DOCK

Baltimore, Md.

Hull 6136, carfloat for Western Maryland R.R.; 190'x35'x9'; keel Aug. 12/26.

CHARLESTON DRY DOCK AND MACHINERY COMPANY

Charleston, S. C.

Purchasing Agent: Charles R. Valk.

Towboat, owner not named; 64 ft. long; keel Nov. 17/26; **launched Feb. 2/27.**

Dredge for Gulf Refining Co.; 95'x30'x8'; keel Oct. 11/26; **launched Dec. 7/27.**

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.

Philadelphia, Pa.

Purchasing Agent: Ed. C. Geehr.

Malolo, hull 509, express pagr and frt liner, Matson Navigation Co.; 582 LOA; 577 length at water line; 83 ft beam; depth molded to C deck 54 ft.; displacement 22,050 tons; 8250 DWT; speed 22 knots regular, 23 knots maximum; 25,000 shaft horsepower; Cramp-Parsons turbines; oil burning B & W water-tube boilers; **keel May 4/25**; launched June 26/26; deliver May 1/27 est.

Yarmouth, hull 518, twin screw passenger and freight steamer for Eastern Steamship Lines; 378 length at water line; 55-6 beam; 29-6 molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears, six single-ended Scotch boilers; keel Feb. 23/26; launched Nov. 6/26; deliver Apr. 1/27 est.

Evangeline, hull 524, twin screw passenger and freight steamer for Eastern Steamship Lines; 378 length at water line; 55'6" beam; 29'6" molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears; 6 single-ended Scotch boilers; keel May 1/26; launch Feb. 12/27 est.; deliver May 1/27 est.

Salt Lake City, hull 531, light cruiser for United States Navy; 10,000 tons displacement; keel Apr./27 est.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

Purchasing Agent: G. O. Williams.

Comoco, hull 122, steel yacht for R. W. Judson, Detroit; 140' L.B.P.; 23'6" beam; 8'9" loaded draft; 15 mi. speed; 260 D.W.T.; 600 I.H.P. diesel engs; keel Dec. 15/26; launch May 1/27 est.; deliver June 1/27 est.

Helen, hull 121, steel yacht, for Chas. E. Sorensen, Detroit; 105 L.B.P.; 17' beam; 6' loaded draft; 13 mi. speed; 110 D.W.T.; 200 I.H.P. diesel engs.; keel Nov. 1/26; launch Apr. 15/27 est.

DRAVO CONTRACTING COMPANY

Pittsburgh, Pa.

Hulls 498-502 inc., 5 steel barges for stock; 230x45x11 ft.; 650. gro tons ea.

Hull 531, 1 diesel engine towboat, Wheeling Steel Corp., Wheeling, W. Va.; 110'x26'x5'; 215 gro. tons.

Hull 534, 1 ladder type sand and gravel dredge for Pittsburgh Plate Glass Co.; 155x44x8ft., 430 gross tons.

Hulls 537-538 inc., two steel whirler boat hulls for Contracting Dept.; 40x48x5'6"; 100 gro. tons.

Hull 539, 1 diesel engined towboat for Labelle Transportation Co., 110'x26'x5'; 215 gro. tons.

Hulls 545-550 inc., 6 pile driver hulls for U.S. Engineers, St. Louis; 88'x25'x4'; 100 gro. tons ea.

Hulls 540-543 inc.; 4 steel barges for Keystone Sand & Supply Co.; 135'x27'x8'; 320 gro. tons ea.

Hull 553-566 inc., 14 steel barges for Mississippi River Commission, Memphis; 120'x30'x7'4"; 430 gro. tons ea

Hulls 569-572 inc., 4 steel hopper type barges for Pittsburgh Plate Glass Co., 135x26x10 ft. 320 gro. tons ea.

Hulls 577-578, 2 dump scows for Pittsburgh Plate Glass Co.; 110x26x8 ft. 6in.; 220 gro. tons. ea.

Hull 579, steam dredge for Ohio River Gravel Co.; 120 x 32 x 6 ft.; 200 gro. tons.

Hull 580, steel hull "A" frame derrick boat for Pittsburgh Plate Glass Co.; 72 x 34 x 5 ft.; 120 gro. tons.

Hulls 581-590 inc., 10 standard steel barges for stock; 100x26x6 ft. 6 in.; 135 gro. tons each.

Hulls 591-600 inc., 10 standard steel barges for stock, 100x26x6ft. 6in.; 135 gross tons each.

DUBUQUE BOAT & BOILER WORKS

Dubuque, Iowa

Purchasing Agent: A. L. Yehger.

Two steel dump scows for U.S. Engineers, Louisville, Ky.

Thorpe, river towboat for Upper Mississippi Barge Line Co. & Inland Waterways Corp.; 132'x35'x3'6"; stern wheel, tandem comp. surface condensing engs.; 15"x30"x78" stroke; keel Oct. 1/26 est.; launch Mar. 1/27 est.; deliver Apr. 1/27 est.

Weber, river towboat, sister to above; keel Oct. 1/26 est.; launch Mar. 1/27 est.; deliver Apr. 1/27 est.

Morse, river towboat, sister to above; keel Oct. 1/26 est; launch Mar. 1/27 est; deliver Apr. 1/27 est.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY

Kearny, N. J.

Purchasing Agent: R. S. Page.

Gulfpride, hull 86, tanker for Gulf Refining Co.; 525' L.B.P.; 74' beam; 28' loaded draft; 11 knots speed; 17,400 D.W.T.; 4500 I.H.P. diesel engs.; keel June 15/26; launched Jan. 20/27; deliver Apr. 1/27 est.

No name, hull 89, passenger and freight steamer for Southern Pacific Steamship Lines, Pier 49, North River, New York; 427 L.B.P.; 60 beam; 25'6" loaded draft; 6700 D.W.T.; De Laval steam turbines; 7700 S.H.P.; 4 B. & W. boilers, 21,900 sq. ft. heating surface; 16,000 sq. ft. superheating surface; **keel Jan. 31/27.**

Hull 90, carfloat for Lehigh Valley Railroad.

Hull 91, same as above.

Hull 92, same as above.

Hull 93, carfloat for D. L. & W. Railroad, 278x39x10 ft.

Hull 94, same as above.

Hull 95, same as above.

GREAT LAKES ENGINEERING WORKS

River Rouge, Mich.

Purchasing Agent: Chas. Short.

Not named, hull 255, bulk freighter for Pittsburgh Steamship Co., Cleveland; 580 L.B.P.; 60 beam! 20 loaded draft; T.E. engs.; 2200 I.H.P.; 3 Scotch boilers 12' diam. by 11'6"; keel Jan. 3/27; deliver May 30/27 est.

S. T. Crapo, hull 256, bulk cement freighter for Huron Transportation Co.; 385 L.B.P.; 60 beam; 19 loaded draft ;11 mi. speed; 7200 D.W.T.; T.E. engs.; 1800 I.H.P.; 3 Scotch boilers, 12 ft. 9 in. diam.; keel April 1/27 est.; launch Aug. 1/27 est.; deliver Oct. 1/27 est.

HOWARD SHIPYARDS & DOCK COMPANY

Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

No name, hull 1590, diesel-electric side-wheel excursion boat for stock; 250x40x7 ft.; 15 mi. speed; 2-400 H.P. 6-cyl. diesel engs.

Hull 1593, steel hull for stmr. Mississippi of Mississippi River Com., St. Louis, Mo.; keel Sept. 25/26; launch and deliver Feb. 5/27 est.

Hull 1597, steel guide dock for E. T. Slider, New Albany, Ind.; 120'x24'x4'; keel Nov. 16/26; launch Feb. 14/27 est.

Hull 1598, same as above; **keel Nov. 26/26**; launch Feb. 20/27 est.

Hull 1599, same as above; keel March 4/27 est.

Hull 1600, same as above; keel Mar. 4/27 est.

Hull 1601, hull for Baton Rouge Car Terminal, Baton Rouge, La.; 285'x60'x9'6"; keel March 1/27 est.

Not named, hull No. 1603, diesel ferryboat for Tri-State Ferry Co., Cairo, Ill.; 100 L.B.P.; 30' beam; 5' depth; 9 mi. loaded speed; 125 D.W.T.; 6-cyl. diesel eng.; 180 I.H.P.; **keel Jan. 3/27.**

MANITOWOC SHIPBUILDING CORPORATION

Manitowoc, Wis.

Purchasing Agent: H. Meyer.

Hull 227, one car ferry for Grand Trunk Milwaukee Car Ferry Co.; 360' L.O.A.; 58' molded beam; 21'6" depth; 2 T.E. engs.; 4 Scotch boilers; launch Jan. 19/27 est.; deliver Mar. 1/27 est.

(Continued on Page 156)

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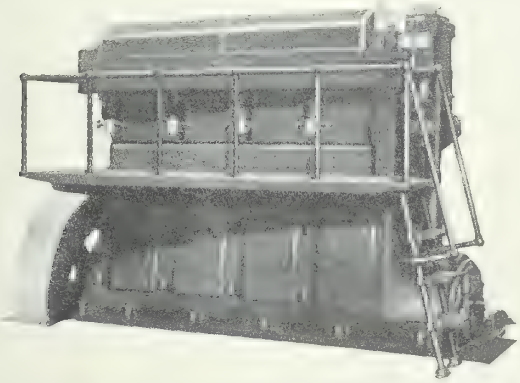

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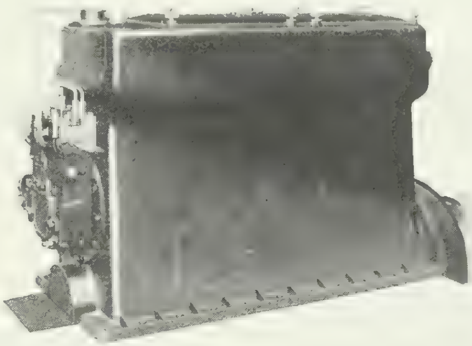

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MARIETTA MANUFACTURING COMPANY

Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Thirty steel discharge pontoons for U.S. Army Engineers, Rock Island, Ill.; 38'x14'x3'2"; **3 launched.**

One steel stern-wheel towboat for Magdalena River, Colombia; 125'x26'x5'; tandem compound engs.; keel laid.

Twelve steel hoppered cargo barges for Magdalena River, Colombia; 125'x26'x6'; **7 launched.**

MIDLAND BARGE COMPANY

Midland, Pa.

Purchasing Agent: H. S. Neal.

One barge for Southern Cotton Oil Co., 100x35 x 7 ft.; keel Nov. 15/26; launched Dec. 1/26.

Fifteen barges for Inland Waterways Corporation, 126'x33'x7'6"; 6 keels laid; **6 launched.**

Steel sand and gravel dredge hull for E. T. Slider, New Albany, Ind.; 175'x50'x6'; keel Mar. 1/27 est.

MIDLAND SHIPBUILDING COMPANY, LTD.

Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

City of Hamilton, hull 18, package freighter for Canada Steamships, Ltd.; 230 L.O.A.; 38 beam; 23 depth; T.E. engs.; keel Oct. 11/26; **launched Jan. 12/27;** deliver Apr. 15/27 est.

City of Montreal, hull 19, package freighter same as above; keel Oct. 11/26; **launched Jan. 12/27;** deliver Apr. 15/27 est.

Not named, hull 20, package freighter for Canada Steamship Lines, Ltd.; 250 L.B.P.; 42 beam; 26 ft. 6 in. draft; **keel Jan. 18/27;** deliver May 15/27 est.

Not named, hull 21, sister to above; **keel Jan. 18/27;** deliver May 15/27 est.

NASHVILLE BRIDGE COMPANY

Nashville, Tenn.

Purchasing Agent: Leo E. Wege.

Hull 108, dredge, owner not named; clam shell bucket type; 110'x51'6"x8'; steam eng.; keel fall 1927 est.

Hulls 113 to 118 inc., deck barges for stock.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas: Plummer, 233 Broadway New York City.

Iroquois, hull 306, passenger and freight steamship for **Clyde Steamship Company, New York, 407'-3" overall, 62'-0" beam, 30'-6" depth, Newport News turbines and gear; 8500 I.H.P.; Scocth** boilers; oil burning; keel March 20/26; launched Dec. 11/26.

Shawnee, hull 307, sister to above; keel May 15/26; launch Feb. /27 est.

California, hull 315, 18-knot, passenger liner **for Panama Pacific Line, New York; 600 ft. long, 80 ft. beam, 52 ft. depth; watertube boilers for oil** 22,000 gross tons; 17,000 I.H.P.; keel Mar. 20/26; launch /27 est.

Northland, hull 318, coast guard cutter for **U. S.** Government; 216' long; 39' beam; 24'9" draft; diesel-electric propulsion; McIntosh & Seymour engs.; keel Aug. 16/26; launch Feb. /27 est.

Caracas, hull 319, passenger and freight steamer for Red D Line, New York; 335'4" L.O.A.; 51' beam; 22' draft; Newport News turbines and gears; water-tube boilers; 3560 D.W.T.; 4000 S.H.P.; keel Nov. 18/26.

THE PUSEY & JONES CO.

Wilmington, Del.

Purchasing Agent: James Bradford.

Not named, hull 1031, single screw passenger **freight steamer for Baltimore & Philadelphia Steamboat Co., Philadelphia; 219 L.B.P.; 45 beam; 11 loaded draft; 14½ mi speed; 4 crank, TE engs. 21-32-35-35 by 24"; two B. & W. water-tube** boilers, 3046 sq. ft. heating surface each.

Peter Stuyvesant, hull 1033, steel single screw day steamer for Hudson River Day Line, New York; 252 L.B.P.; 46 beam; 4-cycle, triple expansion engs.; 2800 I.H.P.; 4 B. & W. water-tube boilers; 11x12 200 lbs. pressure; keel Sept. 15/26; **launched Feb. 2/27.**

Not named, hull 1034, steel twin-screw diesel yacht from Henry J. Gielow, Inc., naval architect, for Col. Edward Green, New York, 294' L.O.A.; 38'3" beam; 16' loaded draft; 2 Bessemer diesel engs.; total of 3000 H.P.

STATEN ISLAND SHIPBUILDING COMPANY

Mariner's Harbor, N. Y.

Purchasing agent: R. C. Miller.

American Legion, hull 764, **ferryboat for City of New York, 264 L.O.A.; 66 beam over-all, 47 beam mld.; 14 loaded draft; 15 mi. speed; abt. 2600 gro. tons; 2 comp. engines, 3500 I.H.P.; 4** W.T. boilers; keel Feb. 8/26; launched Sept. 29/26; deliver Feb 15/27 est.

Meitowax, hull 768, tugboat for Long **Island** Railroad Co.; 108' L.O.A.; 26' beam; 13'2" molded depth; diesel-electric propulsion; keel June 16/26; launched Nov. 27/26; deliver Feb. 15/27 est.

Hull 769, grain elevator for International Elevating Co.; 130 L.O.A.; 35 beam; 9 loaded draft forward 11 loaded draft aft.; diesel engs.; keel Sept. 30/26; **launched Jan./27.**

Hull 771, steel caisson for Mid-Hudson Bridge.

Hull 772, steel caisson for Mid-Hudson Bridge.

Not named, hull 774, steam tug for Standard Transportation Co.; 100 ft. 2 in. L. B.P.; 24ft. 1in. beam; 12ft. 3in. depth; 15 knots speed; comp. engs. 850 I.H.P.; 1 Scotch boiler 14ft. 9in. dia. by 12ft.; deliver Aug./27 est.

Not named, hull 775, steam tug, sister to above.

SUN SHIPBUILDING COMPANY

Chester, Penn.

Purchasing Agent: H. W. Scott.

Hull 98, hydraulic dredge for American Dredging Co.; 110x31'10"x10'; keel Aug. 10/26; **launched Jan. 4/27.**

Not named, hull 101, twin screw motor tank barge for Gulf Refining Co.; 136'x27'x11'6"; 400 B.H.P. engs.; to carry 385 tons on 9' draft; 9 kts. speed; keel Dec. 2/26.

Not named, hull 102, sister to above; keel Dec. 2/26.

Not named, hull 103, twin screw motor tank barge for Tidewater Oil Co.; 252' long; 40' beam; 14' depth; to carry 1885 tons on 12' draft; 10 kts. speed; keel Jan. 3/27.

Not named, hull 104, single screw bulk oil steamer, owner not named; 480' long; 65' 9" beam; 37" depth; to carry 13,000 tons on 27'6" draft; speed 12½ knots speed; 4250 I.H.P.

TOLEDO SHIPBUILDING CO.

Toledo, Ohio.

Purchasing Agent: Otto Hall.

Not named, hull 177, car ferry for Wabash Ry. Co.; 388 L.B.P.; 57'6" beam; 16' loaded draft; 13½ mi. speed; 2500 D.W.T.; T.E. engs.; 2500 I.H.P.; 4 Scotch boilers, 14'6" diam.; keel Nov. /26; launch Jan./27 est.; deliver Mar./27 est.

Not named, freighter, hull 178, for Pittsburgh Steamship Co.; 580 L.B.P.; 60' beam; 19' loaded draft; 12½ mi. speed; 12,500 D.W.T.; T.E. engs.; 2500 I.H.P.; 3 Scotch boilers, 14' diam,; keel Jan. /27 est.; launch May/27 est.; deliver July/27 est.

TODD DRYDOCK & ENGINEERING REPAIR CORP.

Brooklyn, N. Y.

Purchasing Agent: H. J. Shannon.

No name, hull 40, diesel-electric ferryboat for Dept. of Plant & Structures, City of New York; 101 ft. 6 in. length over guards; 27 ft. 7 in. beam; 6 ft. 8¾ in. loaded draft; 300 I.H.P. Nelseco diesel engine.

No name, hull 41, diesel-electric ferryboat, sister to above.

THE CHARLES WARD ENGINEERING WORKS

Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Hull 53, steel barge for W. C. Kelly Barge Line; keel Sept. 30/26; **launched Dec. 22/26.**

Hull 54, same as above; keel Sept. 29/26.

Hull 55, same as above; keel Jan. 3/27.

Hull 56, same as above.

Hull 57, same as above.

Hull 58, same as above.

Hull 59, same as above.

W. A. Shepard, hull 60, **towboat for W. C.** Kelly Barge Line; screw propeller, 2 Fairbanks-Morse diesel engs.; 720 B.H.P.; keel Sept. 23/26; **launched Jan. 11/27.**

Duncan Bruce, hull 61, **stern-wheel towboat, for** W. C. Kelly Barge Line; **135'x35'x6'; Fairbanks**-Morse diesel engs.; **keel Jan. 17/27;** launch Feb. 28/27 est.

Not named, hull 62, diesel powered stern wheel survey boat for Mississippi River Comm., Dredging Dist., Memphis, Tenn.; 139'6"x24'x5'3".

Repairs

BETHLEHEM SHIPBUILDING CORP., LTD.. UNION PLANT

Drydock, paint, misc. repairs: O. A. Knudsen, San Pedro, C. D. Johnson, Fred W. Weller, Ruth Alexander, Argyll, Harvard, Canadolite, Jane Christenson, U.S.S. California, U.S.S. Maryland, West Islip, Suspearco, Vermont, J. C. Fitzsimmons, Barge No. 108. Drydock, paint, eng. and boiler repairs: Yale. Engine repairs: Star, Coalinga, Los Alamos, Maunalei, President McKinley, Erskine M. Phelps, Suboatco, Montpelier. Drydock and paint: California, Pan. Amer. No. 1. Propeller repairs: Suspearco, Tosca, Associates. 1 Tailshaft: Admiral Evans. Winch repairs: Montibello, Frank H. Buck. Misc. repairs: Anatena, Gen. Pet. No. 1, Edgar F. Luckenbach, Boren, Denali, La Purisima, West Prospect, Nora, Cuba Maru, Los Angeles, W. L. Steed, Suelco, Gedania, Tejon, San Fabian, Traveler, Suholco, Bearport, Carbis, Crenatula, La Placentia, Stuart Dollar, Margaret Dollar, Cero Azul, Point Bonito, Broad Arrow, Point Loma, Solano, Point Arena, San Diego, Katherine, Tahoe, Hoquiam, Whitney Olson, Prentiss, Georgian, West Henshaw, Richmond, Sagadahoc, Betterton, Hauraki, American, Makura, Suremico, Lio, Alaska Standard, Scalaria, Virginia, A. L. Kent, Ontariolite, Lebec, Shell Barge No. 6, Maunawili, Oaxaca, Panaman, Santa Cecilia, Coalinga, Charlie Watson, Kentuckian, Union Oil Barge 1923, Willfaro, Finland, President Monroe, W. E. Hutton, Dakotan, Ohioan, President Wilson, H. M. Storey, Martinez, Sinaloa, Montanan, Manchuria, Montana.

CHARLESTON DRY DOCK AND MACHINERY CO.

Charleston, S. C.

Drydocked and repairs: stmrs. W. F. Burdell, Manchioneal, Carolinas, Shickshinny, m.s. Tender Mangroe. Misc. repairs: m.s. dredge Creighton, John M. Millikew, tug Jas. H. Clark, s.s. Latonia Beach, launch Tickaroan, yachts, Sarita, Jean and Virginia.

COLLINGWOOD SHIPBUILDING CO.,

Collingwood, Ontario

Purchasing Agent: E. Podmore.

Convert into package freighter, including gangway doors, alterations of hatches, accommodations, etc., bow damage repairs: stmr. Canatco. Alterations of hatches, bow damage repairs: stmr. Dalwarnic. Recondition: tug Peel.

CRAIG SHIPBUILDING CO.,

Long Beach, Calif.

Purchasing Agent: F. W. Philpot.

Caulk entire bottom, sheath, paint, misc. repairs to boilers and machinery: dredge San Francisco No. 2. Clean and paint: schrs. Marion G. Douglass, McCready, tugs J. F. Craig, Pilot, yachts Samona (also misc. repairs), Georgeanna, Seaward, Windward, dredge Monterey, stmr. Trinidad, m.s. Patricia, barge No. 2. Docked for inspection: tug Sea Prince.

GENERAL ENGINEERING & DRY DOCK COMPANY,

Alameda, Calif.

Drydock, clean, paint, misc. repairs: stmrs. Annie Christenson, J. D. Peters, Idaho, Mayfair, Cascade (install new smoke stack and umbrella), Oregon, ferry San Jose, gas s. Oakland. Drydock, install oil burning system: Corsicana. Extensive repairs: Bering. Drydock, miscellaneous repairs: Danial Company dump barge, steamer Brooklyn. Forge repairs: schr. Doris Crane. Drydock, general repairs: stmr. Montezuma. Jobs listed in February report and not yet completed: stmrs. Stanwood, Elizabeth, Phyllis, Corrales, Coquina, gas s. Elia.

LAKE WASHINGTON SHIPYARDS

Houghton, Wash.

Renew rotten wood in hull: Lotus. Overhaul and drydocked about 40 fishing boats and cannery tenders.

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATON

San Pedro, Calif.

Damage repairs (including docking) amounting to $345,000. Associated Oil Tanker Solano. General reconditioning: stmr. City of Honolulu.

THE MOORE DRY DOCK COMPANY,

Oakland, Calif.

Drydock, clean, paint, misc. repairs: Port Angeles, Socony, Tahchee, S. A. Perkins (also repair steering eng.), Makiki, El Paso, C. & H. pile driver barge, ferries Sacramento, New Orleans. Drydock, clean, paint, hull repairs: King Coal Barge No. 1, Willamette, Barge O-30, W. P. Barge No. 1, Dispatch No. 2 (also furnish tail shaft), Potrero (also caulk bottom). Drydock, engine and deck repairs: Manulani, Santa Barbara (also misc. repairs). Drydock, damage repairs: W. P. Barge No. 2, West Mingo (also misc. eng. & deck repairs), Westport (also paint and repairs to bulwark and davit). Drydock, renew struts on rudder post: Brooklyn. Hull and engine repairs: Port Angeles. Steering gear repairs: R. J. Hanna. Deck and engine repairs: Maunalei. Damage repairs: Wm. F. Herrin. Eng. repairs: Costa Rica, S.O. Barge No. 93. Propeller repairs: Dorothy Wintermote. Tail shaft: Makena. Voyage and hull repairs: Ventura. Misc. repairs: Southwestern Miller, Ryder Hanify, Suelco, Makiki, Santa Monica, General, Tiverton, Red Bird, Stockton.

U. S. NAVY YARD,

Bremerton, Wash.

Drydock, misc. repairs: Mississippi, Moody, Somers, Stoddert, Paul Hamilton. Misc. repairs: Pennsylvania, Idaho, Mahopac, Swallow, Challenge, Pawtucket, Sotoyomo, Tatnuck, Missoula.

TODD DRY DOCKS, INC.,

Harbor Island, Seattle, Wash.

Drydock, clean, paint, misc. repairs: s.s. Alaska, Jane Christensen, West Notus. Drydock and voyage repairs: President Jefferson. Drydock for survey: Coya, Northwestern. General overhaul: Jacob Luckenbach. General alterations and overhaul: Mary D. Eng. repairs: Paris Maru. Misc. repairs: Admiral Evans, Admiral Peary, Jane Christensen, Cross Keys, Deuel, Dorothy Alexander, Hegira, Lochgoil, Nordhval Drydock, minor repairs: Admiral Rogers.

VICTORIA MACHINERY DEPOT CO., LTD.,

Victoria, B. C.

Dock, clean, paint: stmr. Gray, Princess Patricia (also tail shaft, propeller, and hull repairs), Princess Maquinna (also tail shaft and propeller repairs). Hull repairs: tug Red Fir.

Who's Who afloat and ashore

Edited by Jerry Scanlon

So's Your Old Man.

Development of the intercoastal passenger and freight trade has been such that the Panama Pacific Line contemplates the construction of two additional ships of the same dimensions as the liner California, which is now being built at the Newport News Shipbuilding & Drydock Company, according to Captain Roger Williams, operating manager of the International Mercantile Marine Company.

Captain Williams made this statement while in San Francisco during a month's inspection tour of the Panama Pacific terminals and offices. The California is to be launched late in July of this year and is to be delivered sometime in the late fall. A California girl will sponsor the new ship, which is the largest of her type ever built under the American flag. The cost of the liner will be about $6,000,000.

Captain Williams, who was naval aid to General Pershing during the late war, had the distinction of piloting the first naval vessel through the Panama Canal, the warship being the U.S.S Missouri. He served in the Navy for twenty-one years prior to joining the International Mercantile Marine seven years ago. This is the first visit of Captain Williams to the Pacific Coast since 1915.

With the inauguration of an aggressive program of safety on the San Francisco waterfront on behalf of the three associations interested therein—namely, the Pacific American Steamship Association, the Shipowners' Association of the Pacific Coast, and the Waterfront Employers' Union—the appointment has been announced of a safety engineer to supervise this work. The Safety Committee has engaged B. O. Pickard to take charge of safety and welfare, with offices at 336 Battery Street. Mr. Pickard was formerly district engineer under government service of the Bureau of Mines, having had considerable experience in safety work.

Frederick Sturgess, advertising and publicity manager for the McCormick Steamship Company, recently made a three weeks' visit to the company's freight, passenger, lumber offices and properties, in connection with his company's advertising for the ensuing year, in Oregon and Washington.

Mr. Sturgess visited Seattle, Tacoma, Vancouver, B.C., Spokane, Portland, St. Helens, Astoria, Port Ludlow, Port Gamble, and other points, including the lumber camps and booming grounds of the McCormick Company. He is of the opinion that prospects for the year 1927 are very hopeful and reports a sound feeling of optimism throughout the Northwest.

Fully recovered from his injuries sustained when he slipped on the deck of his vessel at Monterey and was confined to a hospital for several weeks, Captain Austin Keegan is now back in command of the coastwise carrier Daisy Freeman.

Captain Keegan at one time was one of the youngest sailing-ship masters under the American flag. When he was twenty-three years old he piloted the ship William Nottingham on a voyage from Puget Sound to Boston Harbor via Cape Horn.

Before the William Nottingham sailed, old skippers on the Sound predicted that the vessel's thirteen feet high deckload of poles would cause no little trouble and were free in their expressions that the trip would never be completed.

However, the deckload proved the salvation of the vessel when she was crippled and in a sinking condition off the Horn, after a five days' hurricane. The William Nottingham made Boston after a voyage of 158 days.

As it must to all men, death claimed Alexander Barr at his home in Alameda recently after a short illness.

Since leaving the sea as chief officer of the old China Mail Liner Nile, Barr had been identified with a leading automobile firm, with headquarters in Oakland.

There were few ports in the world where Barr was unknown. For years he served as chief officer of the liner Nile under Captain John T. Kinley (the latter now a Shanghai pilot). Barr was a hero of the World War, being decorated for his meritorious service as commander of a British destroyer. He commanded one of the destroyers during the onslaught at the Dardanells. He later in peace time was skipper of various steamers of the Union Steamship Company.

News of his death was received as a deep shock to friends afloat and ashore in all parts of the world, and his late home was flooded with messages of condolence.

From oiler to chief engineer in sixteen years on the same steamer, that's the record of Chief Engineer William Webber, who has just resigned his berth on the Los Angeles Steamship Company's coastwise liner Yale to assume charge of the engine room of the new Russ Building, San Francisco's latest skyscraper.

Webber mounted the ladder to the highest berth aboard the Yale in the engine room without changing to another vessel, which is believed to be a record in the maritime world. He served as chief engineer of the craft during the period when that speedy vessel did such valiant work as a troopship between England and France across the English Channel during the World War.

Thomas McDonald, who has been first assistant engineer, succeeded Weber, according to an announcement by Ralph J. Chandler, general manager of the Los Angeles Steamship Company. Fellow workers presented their former chief engineer with a writing set on the eve of his departure to the shoreside berth in the Russ building.

Captain James Aspe, who served for many years as chief officer aboard the Los Angeles Steamship Company's coastwise carrier Harvard is now engaged in the stevedoring business at San Diego. Life ashore is fine, according to Captain Aspe, but the call of the sea persists in surging through his veins every now and then and 'tis hard to resist this lure.

Reconditioning of the freighter Cross Keys, allocated by the Shipping

(Continued on Page 30)

5 Fleets which Cover 80,000 miles

The magnitude of McCormick Steamship operations is in keeping with the rapid growth of Pacific Coast Marine Commerce.

Ships in the dependable McCORMICK service are grouped into five distinct fleets—

COASTWISE INTERCOASTAL

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AMERICAN-HAWAIIAN S. S. CO.
J. R. Fitzgerald, agent.
215 Market street. Phone Davenport 2900.
C. L. Gibb, assistant agent.
Tribune Tower, Oakland. Phone Oakland 1022.

FREIGHT ONLY.

SAILINGS—Every 4 days from San Francisco, Oakland, Alameda, and Los Angeles to New York, Philadelphia, and Boston.

SAILINGS—Every 20 days from Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, Alameda and Los Angeles, to Charleston, S. C.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.

FREIGHT ONLY.

SAILINGS—Every 2 weeks between Vancouver, Seattle, Portland, San Francisco, Los Angeles and New York, Boston, Providence, Philadelphia, Baltimore, and Portland, Me.

ARROW LINE
Sudden and Christenson, Managing Agents.
230 California street. Phone Garfield 2846.

FREIGHT ONLY.

SAILINGS—Westbound.
Weekly from Baltimore, fortnightly from Norfolk and Savannah to Los Angeles, San Francisco, Oakland, Portland, and Seattle.

CALIFORNIA & EASTERN S.S. CO.
325 Merchants' Exchange Bldg. Ph. Kearny 1610 and Kearny 144

FREIGHT ONLY.

SAILINGS—Monthly from New York, Philadelphia and Baltimore to Los Angeles, San Francisco, Oakland and Seattle.

DOLLAR STEAMSHIP LINE
The Robert Dollar Co.
311 California street. Phone Garfield 4300.
Oakland office: 406 Thirteenth St.

PASSENGERS AND FREIGHT.

SAILINGS—Fortnightly from Boston and New York to Los Angeles and San Francisco.

FREIGHT ONLY.

SAILINGS—Regularly between San Francisco, Seattle, Los Angeles, New York, Philadelphia, Baltimore, and Norfolk.

GULF PACIFIC LINE
Swayne & Hoyt, Inc., managing owners.
430 Sansome street. Phone Davenport 6700.

FREIGHT ONLY.

SAILINGS—Semi-monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco, and Los Angeles to Puerto Colombia, Curacao, Houston, Beaumont, Tampa, Mobile, New Orleans, calling at Oakland westbound.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents
230 California street. Phone Sutter 3600

FREIGHT ONLY.

SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego, and New York, Boston, Providence, Philadelphia, Baltimore, Norfolk, and Portland, Me.

SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also monthly direct to Hawaii from Philadelphia, Boston and New York.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc
201 California Street. Phone Davenport 7600.
Oakland Office and Dock: 1st and Market Sts. Phone Lakeside 1383.

FREIGHT ONLY.

SAILINGS—North Atlantic-Intercoastal.
Every Tuesday from Seattle, every Saturday from Portland, every Thursday from San Francisco, and every Saturday from Los Angeles; also every seven days from Tacoma, Vancouver, and Oakland, to Philadelphia, New York, and Boston.

SAILINGS—Gulf.
Every 16 days from Seattle, Tacoma, Vancouver, Portland, San Francisco, Oakland and Los Angeles to New Orleans, Houston, and Mobile; also alternately calling at Galveston and Beaumont.

MUNSON-McCORMICK LINE
McCormick Steamship Co., Pacific Coast agents.
215 Market street. Phone Davenport 3500.

FREIGHT ONLY.

SAILINGS—Regularly between New York and Baltimore and Los Angeles, San Francisco, Oakland, Portland, Seattle, and Tacoma.

SAILINGS—Semi-monthly between Philadelphia, Boston (westbound) and Los Angeles, San Francisco, Oakland, Portland, Seattle, and Tacoma.
Baltimore (westbound) and Los Angeles.

SAILINGS—Pacific Havana-Jacksonville Line.
Monthly from Seattle, Tacoma, Portland, San Francisco, and Los Angeles to Havana, Cuba, and Jacksonville, Florida.

PANAMA MAIL STEAMSHIP CO.
2 Pine street. Phone Sutter 3800.

PASSENGERS AND FREIGHT.

SAILINGS—Every 21 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, and New York. Westward calls: New York, Puerto Colombia, Cartagena, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Los Angeles, and San Francisco.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Passenger and General Offices: 460 Market St. Phone Douglas 8680.
Freight and Operating Offices: Pacific Steamship Co., 311 California St. Phone Davenport 3300

PASSENGERS AND FREIGHT.

SAILINGS—Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle, and Tacoma.

QUAKER LINE
Williams, Dimond & Co., Agents.
310 Sansome St. Phone Sutter 7400.

FREIGHT ONLY.

SAILINGS—Every two weeks between Philadelphia and Los Angeles, San Francisco, Oakland, Portland.

TRANSMARINE LINES
W. D. Benson, Pac. Coast Mgr.
310 Sansome street. Phone Davenport 6760.
285 Federal Telegraph Bldg., Oakland. Phone Lakeside 3580.

FREIGHT ONLY.

SAILINGS—Every 10 days between Port Newark and Los Angeles, San Francisco, and Oakland.
Two vessels monthly from Mobile and New Orleans to Pacific Coast ports.

WILLIAMS LINE
Williams Steamship Company, Inc.
110 California street. Phone Douglas 1670
A F Zipf, Pacific Coast manager.

FREIGHT ONLY.

SAILINGS—Twice monthly between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, San Diego, and New York, Philadelphia, Norfolk, and Baltimore.

SEATTLE

AMERICAN-HAWAIIAN S. S. CO.
Henry Dearborn, agent.
Mutual Life Bldg. Phone Eliot 8120.
Tacoma: Baker Dock. Phone Main 2243.

FREIGHT ONLY.

SAILINGS—Every 9 days from Seattle, Tacoma, Portland, Astoria to New York, Philadelphia, and Boston.

SAILINGS—Every 20 days from Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, Alameda, and Los Angeles to Charleston, S.C.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
Alaska Building. Phone ELiot 2450.

FREIGHT ONLY.

SAILINGS—Every 20 days from Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, land, San Francisco, and Los Angeles and New York, Boston, Providence, Philadelphia, Baltimore, Norfolk, and Portland, Me.

ARROW LINE
Sudden & Christenson, agents.
Arctic Building.

FREIGHT ONLY.

SAILINGS—Westbound.
Weekly from Baltimore, fortnightly from Norfolk and Savannah to Los Angeles, San Francisco, Oakland, Portland, and Seattle.

CALIFORNIA & EASTERN S.S. CO.
Johnson Shipping Co., Inc., Agents.
5546 White Henry Stuart Bldg.

FREIGHT ONLY.

SAILINGS—Monthly from New York, Philadelphia, and Baltimore to Los Angeles, San Francisco, Oakland, and Seattle.

DOLLAR STEAMSHIP LINE
Admiral Oriental Line, agent.
1519 Railroad Ave. S. Phone ELiot 2068.

FREIGHT ONLY.

SAILINGS—Regular sailings between Seattle, San Francisco, Los Angeles, and New York, Philadelphia, Baltimore, and Norfolk.

GULF PACIFIC LINE
Swayne & Hoyt, Inc., managing owners.
Suite 201, Central Bldg. Phone ELiot 6383.

SAILINGS—Semi-monthly from Seattle and Puget Sound, Portland, and Columbia River, San Francisco, and Los Angeles to Puerto Colombia, Curacao, Houston, Beaumont, Tampa, Mobile, New Orleans, calling at Oakland westbound.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Alaska Building. Phone ELiot 2450.

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SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also monthly direct to Hawaii from Philadelphia, Boston and New York.

LUCKENBACH LINES
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L. C. Smith Building. Phone ELiot 1206.

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SAILINGS—North Atlantic-Intercoastal.
Every Tuesday from Seattle, every Saturday from Portland, every Thursday from San Francisco, and every Saturday from Los Angeles; also every seven days from Vancouver, Tacoma, and Oakland, to Philadelphia, New York and Boston.

Sailings—Gulf.
Every 16 days from Seattle, Tacoma, Vancouver, Portland, San Francisco, Oakland and Los Angeles to New Orleans, Houston, and Mobile; also alternately calling at Galveston and Beaumont

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—LOCAL—
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†S.S. Venezuela	Mar. 12	Mar. 14	*S.S. Corinto	——	Mar. 9
*M.S. City of S.F.	Mar. 19	Mar. 21	*M.S. City of Panama	——	Mar. 25
†S.S. Ecuador	Apr. 2	Apr. 4	†S.S. Colombia	Mar. 26	April 5
*S.S. Corinto	Apr. 9	....	*M.S. City of Panama		Mar. 25
*M.S. City of Panama	Apr. 23	Apr. 25	†S.S. Venezuela	Apr. 16	Apr. 26

*—Ports of Call—Mazatlan, Champerico, San Jose de Guatemala, Acajutla, La Libertad, La Union, Amapala, Corinto, San Juan del Sur, Puntarenas, Balboa and Cristobal.
†—Ports of call—Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal and (Havana eastbound only), Cartagena and Puerto Colombia (Westbound only), and New York.

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2 PINE ST.
San Francisco, Cal.
10 HANOVER SQUARE
New York City

Who's Who

(Continued from Page 27)

Board to the American-Australian Oriental Line at Seattle, has been completed. The work was carried out under the direction of L. J. Taylor, assistant port engineer for Swayne & Hoyt. The carrier is said to be in shipshape condition. Mr. Taylor returned home to San Francisco on completion of the vessel's overhauling.

San Francisco now boasts the only woman passenger agent on the Pacific Coast and, as far as we know, the only woman in the United States holding a berth of this kind. The Nippon Yusen Kaisha, through General Passenger Agent T. Asaka, announces that Miss Esther Green is the young lady upon whom the title of City Passenger Agent in the San Francisco offices has been conferred.

Harry S. Scott, active chief of the General Steamship Corporation's destinies, announces the appointment of two well-known and popular men of the steamship fraternity as executives for General Steamship Corporation at Seattle. Kenneth C. Jones, who was identified for many years with the Seattle offices of the Canadian Pacific Ocean Services, has been appointed North Pacific agent. He was also for many years with the Royal Mail Steam Packet Line. Willis H. Kemp is now in charge of the Seattle chartering office.

Captain Randall Rogers, who was appointed a member of the Port of Los Angeles Harbor pilots the first of this year, has resigned. Captain Rogers was for more than a year master of the coastwise liner Harvard and later skipper of the Swayne & Hoyt freighter Hollywood. He now plans to become identified with a steamship line shoreside at Los Angeles Harbor.

Captain Chester W. Gilbert, master of the Panama Mail liner Venezuela, who has the distinction of being one of the largest skippers sailing out of the port of San Francisco, tells this yarn that occurred on the last trip of the vessel to New York.

Aboard the vessel was a convention of delegates en route to the East Coast. As usual, one of the voyagers was the life of the party. From the time the Venezuela sailed from San Francisco until Mazatlan was reached this member spent most of the time playing jokes on fellow travelers.

One day several of the passengers were slightly under the spell of mal de mer. Up on deck walked the Practical Joker with several sandwiches. He offered them to those who were sea-sick, but they refused.

Then walking to the rail he proceeded to munch one of the sandwiches. Just then a whale was sighted.

"Oh! Look!" exclaimed the erstwhile Practical Joker, opening wide his mouth. A second later his upper set of molars had dropped overboard. From then on, until Balboa was reached, the Practical Joker remained in his cabin, partaking of gruel and other soft edibles. At the Canal a new set of molars was secured and joy reigned once again.

Fred M. Fenwick is now manager of the Charles Nelson Company with offices at San Francisco.

George S. Beadle, who has put in some forty years along the San Francisco waterfront, is now with the Nelson Steamship Company at that port.

W. J. Blake, for several years with the Matson Navigation Company as engineer of various steamers, is now port engineer at San Francisco for the Nelson Steamship Company.

From cadet to captain in six years is a pretty good argument that the sea affords the ambitious young American an excellent career. Take the case of Howard E. Wollaston, who has just been presented with his master's ticket at the age of twenty-four years.

At the age of eighteen, young Wollaston started with the Matson Navigation Company as cadet. Later he joined the Panama Mail and Dollar Lines, all the while studying and advancing. At the earliest opportunity

(Continued on Page 34)

INTERCOASTAL

PANAMA-PACIFIC LINE
International Mercantile Marine Company.
Pacific Steamship Company, freight agents.
PASSENGER AND FREIGHT.
SAILINGS—Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle, and Tacoma.

QUAKER LINE
Columbia Pacific Shipping Co., General Agents.
Porter Building. Phone Broadway 5360
FREIGHT ONLY.
SAILINGS—Every two weeks between Philadelphia and Los Angeles, San Francisco, Oakland, and Portland.

VANCOUVER

ARGONAUT STEAMSHIP LINE
B. W. Greer & Son, Ltd.
602 Hastings St., West. Phone Seymour 7929.
FREIGHT ONLY.
SAILINGS—Every two weeks between Vancouver, Seattle, Portland, San Francisco, Los Angeles, and New York, Boston, Providence, Philadelphia, Baltimore, Norfolk, and Portland, Me.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.
B. C. Keely, Pacific Coast manager
Phone Seymour 8420.
FREIGHT ONLY.
SAILINGS—Every 30 days, Vancouver to Montreal (to Halifax during close of navigation). Through bills of lading from other Pacific Coast ports.

ISTHMIAN STEAMSHIP LINES
B. W. Greer &Son, Ltd.
602 Hastings St., West. Phone Seymour 7929
FREIGHT ONLY.
SAILINGS—Intercoastal Service.—Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia, Baltimore, Norfolk, and Portland, Me.
SAILINGS—Hawaiian Service.—Monthly from Baltimore to Hawaii via San Diego and New Angeles; also monthly direct to Hawaii from Philadelphia, Boston, and New York.

ORIENTAL

SAN FRANCISCO

AMERICAN-AUSTRALIA-ORIENT LINE
Swayne & Hoyt, Inc., Managing Operators.
(Operating U.S.S.B. vessels).
430 Sansome Street. Phone Davenport 6700.
FREIGHT ONLY.
SAILINGS—Regular Intervals from Los Angeles, San Francisco, thence direct to Yokohama, Kobe, Shanghai, Hongkong, and Manila. Also calls at Dairen, Taku Bar, Saigon and Cebu if inducements offer.

DOLLAR STEAMSHIP LINE
The Robert Dollar Co.
311 California street. Phone Garfield 4300.
Oakland office: 406 Thirteenth St.
PASSENGERS AND FREIGHT.
SAILINGS—Weekly from San Francisco to Honolulu, Kobe, Shanghai, Hongkong, Manila. Fortnightly to Singapore, Penang, and Colombo.
FREIGHT ONLY.
SAILINGS—Regular sailings between San Francisco and Yokohama, Kobe, Shanghai, Hongkong, Manila, Singapore, Sourabaya, Samarang, and Batavia.
SAILINGS—Guam Service.—Regular sailings between San Francisco, Pearl Harbor, Hawaii, Guam, Cavite (Manila), and Java.

KERR LINES
240 Battery Street. Phone Karny 4100.
General Steamship Corporation, Agents
FREIGHT ONLY.
SAILINGS—Monthly from Los Angeles and San Francisco to Philippines, Japan, China, Dutch East Indies, and Straits Settlements

MITSUI & COMPANY, LTD.
(Mitsui Bussan Kaisha, Ltd)
Merchants Exchange Bldg. Phone Sutter 3414.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.

NIPPON YUSEN KAISHA
551 Market Street Phone Sutter 3900
PASSENGERS AND FREIGHT.
SAILINGS—Liners in the California-Orient service sail fortnightly from San Francisco for Japan and China ports via Honolulu. One sailing every six weeks of liners in the Orient-California-Chile service. These ships call at Mexican, Canal, and South American ports. The Oriental ports of call are Yokohama, Kobe, Moji, Shanghai, and Hongkong

OREGON ORIENTAL LINE
(Operating U. S. S. B. vessels).
Columbia Pacific Shipping Company.
Sudden & Christenson, agents.
230 California street. Phone Garfield 2846.
FREIGHT ONLY.
SAILINGS—Every 3 weeks from Portland to Orient, calling at Yokohama, Kobe, Shanghai, Taku Bar and Dairen, returning via San Francisco.
SAILINGS—Every two weeks from Portland to Yokohama, Kobe, Hongkong and Manila, returning direct to Portland.

OSAKA SHOSEN KAISHA
Williams, Dimond & Co., agents.
310 Sansome St. Phone Sutter 7400.
FREIGHT ONLY.
SAILINGS—San Francisco Service.
Monthly service to and from **Yokohama, Kobe, Moji, Shanghai, Hongkong and Singapore.**

PASSENGERS AND FREIGHT.
SAILINGS—Los Angeles Service—A steamer a month to Koke, Yokohama, Yokkaichi, Nagasaki, Hongkong, Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round-the-world service and on their home-bound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, the Panama Canal and Los Angeles.

YAMASHITA KISEN KABUSHIKI KAISHA
Yamashita Company, Inc., agents.
404 Robert Dollar Bldg. Phone Dav. 2572.
FREIGHT ONLY.
SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe and irregular service from China and Japan ports to San Francisco, Portland, and Seattle.

SEATTLE

AMERICAN MAIL LINE.
City ticket office: Fourth at University.
General Offices: 1519 Railroad Ave. So.
PASSENGERS AND FREIGHT.
SAILINGS—Every 14 days between Seattle, Tacoma. Victoria. B.C., Yokohama. Kobe, Shanghai, Hong Kong, Manila and Honolulu.

AMERICAN ORIENTAL MAIL LINE
General Office: 1519 Railroad Ave. So.
FREIGHT ONLY.
SAILINGS—Regular service to Vladivostok, Dairen, Tientsin, Taku Bar, Tsingtao, Shanghai, and Japan ports on either outward or homeward voyages, as freight offers justify direct call.
SAILINGS—Monthly service to Yokohama, Kobe, Shanghai, Foochow, Amoy, Swatow, Manila, Cebu and Iloilo.

BLUE FUNNEL LINE, LTD.
Dodwell & Co., Ltd., agents.
Stuart Building. Phone ELiot 0147
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Vancouver, Victoria, and Seattle to Yokohama, Kobe, Miike, and Hongkong.

MITSUI & COMPANY, LTD.
(Mitsui Bussan Kaisha, Ltd).
American Bank Building. Phone ELiot 1450.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco, Portland, Seattle and Puget Sound ports, thence to China and Japan.

NIPPON YUSEN KAISHA
801 First Avenue Phone ELiot 5513
PASSENGERS AND FREIGHT.
SAILINGS—Every 10 days, calling at Victoria or Vancouver, B. C., Yokohama, Kobe, Nagasaki, Shanghai, Hongkong, or other Oriental ports as inducements offer.

OCEAN TRANSPORT CO., LTD.
General Steamship Corporation, agents.
Colman Building. Phone ELiot 5706.
FREIGHT ONLY.
SAILINGS—Fortnightly from Portland, Puget Sound, and Vancouver to Japan and North China ports.

OSAKA SHOSEN KAISHA
Pier 6.
PASSENGERS AND FREIGHT.
SAILINGS—Regular fortnightly service to Yokohama, Kobe, Moji, Dairen, Shanghai, Manila and Hongkong.

SUZUKI & COMPANY, Ltd.
Dexter-Horton Bldg. Phone Main 7830.
FREIGHT ONLY.
SAILINGS—Irregular service between Seattle and Japanese ports

THORNDYKE SHIPPING CO.
L. C. Smith Building. Phone MAin 3168.
FREIGHT ONLY.
SAILINGS—Regular service between Puget Sound, Grays Harbor, Vancouver and Yokohama, Kobe, Osaka and Nagoya.

WALKER-ROSS, INC.
L. C. Smith Building. Phone ELiot 1074.
FREIGHT ONLY.
SAILINGS—Regular service between Seattle, and Yokohama, Kobe, Osaka, and Nagoya.

YAMASHITA KISEN KABUSHIKI KAISHA
Yamashita Company, Inc., agents.
Central Building.
FREIGHT ONLY.
SAILINGS—Every 2 weeks from Seattle to Yokohama, Kobe, Osaka, and Nagoya.

LOS ANGELES

AMERICAN - AUSTRALIA - ORIENT LINE
Swayne & Hoyt, Inc., Managing Operators.
(Operating U.S.S.B. vessels).
318 Transportation Bldg. Ph. VAndike 8652.
FREIGHT ONLY.
SAILINGS—Regular intervals from Los Angeles and San Francisco, thence to Yokohama, Kobe, Shanghai, Hongkong, and Manila. Also calls at Dairen, Taku Bar, and Saigon and Cebu if inducements offer.

DOLLAR STEAMSHIP LINE
Passenger office: 514 West 6th Street. Phone TRinity 4891.
Freight office: Central Bldg., 6th and Main Sts.
PASSENGERS AND FREIGHT.
SAILINGS—Weekly from Los Angeles and San Francisco to Honolulu, Kobe, Shanghai, Hongkong, Manila. Fortnightly to Singapore, Penang, and Colombo.
FREIGHT ONLY.
SAILINGS—Regular sailings between Los Angeles, San Francisco and Yokohama, Kobe, Shanghai, Hongkong, Manila, Singapore, Sourabaya, Samarang, and Batavia.
SAILINGS—Guam Service—Regular sailings between San Francisco, Peral Harbor, Hawaii, Guam, Cavite (Manila), and Java.

KAWASAKI-ROOSEVELT LINE
General Steamship Corporation, agents
541 So. Spring street.
FREIGHT ONLY.
SAILINGS—Twice a month from Los Angeles direct to Yokohama, Kobe, Shanghai, Manila, Sourabaya, Samarang, Batavia, Singapore

KERR LINES
541 South Spring Street.
General Steamship Corporation, Agents.
FREIGHT ONLY.
SAILINGS—Monthly from Los Angeles and San Francisco to Philippines, Japan, China, Dutch East Indies, and Straits Settlements

NIPPON YUSEN KAISHA
19 Biltmore Hotel Arcade
PASSENGERS AND FREIGHT.
SAILINGS—Liners Korea Maru and Siberia Maru sail monthly from Los Angeles via San Francisco to the Orient. Every 6 weeks of liners in the Orient-California-Chile service. These ships call at Mexican, Canal, and South American ports. Oriental ports of call are Yokohama, Kobe, Moji, and Hongkong

OSAKA SHOSEN KAISHA
McCormick & McPherson, agents.
Transportation Bldg Phone VAndike 6171
PASSENGERS AND FREIGHT.
SAILINGS—A steamer a month to Kobe, Yokohama, Yokkaichi, Nagasaki, Hongkong, Saigon, Singapore, Colombo, Durban, and Cape Town. These vessels are operating in round-the-world service and on their home-bound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, Panama Canal and Los Angeles

Columbia Pacific Shipping Co.
OWNERS, AGENTS, BROKERS
General Offices: Porter Building, Portland, Ore.

OREGON AGENTS
ARROW LINE
INTERCOASTAL SERVICE
REGULAR SAILINGS—FREIGHT ONLY
New York, Baltimore and Savannah to San Francisco, Portland, Astoria, Seattle.

UNITED AMERICAN LINES
PACIFIC COAST - EUROPEAN SERVICE
REGULAR SAILINGS—PASSENGER, FREIGHT, REFRIGERATOR
Seattle, Portland, Astoria, San Francisco to Liverpool, Glasgow, London, Hull, Bremen, Hamburg, Antwerp

GENERAL AGENTS PACIFIC COAST
QUAKER LINE
INTERCOASTAL SERVICE
REGULAR SAILINGS—FREIGHT ONLY
Philadelphia to Los Angeles, San Francisco and Portland

MANAGING OPERATORS
OREGON ORIENTAL LINE
United States Shipping Board Steamers

TRANS-PACIFIC FREIGHT SERVICE
Portland and Astoria, Ore., to Yokohama, Kobe, Shanghai, Tsingtao, Taku Bar, Tientsin, Dairen, Hongkong and Manila. Transshipment at Shanghai to American River Steamers for Nanking, Pukow, Hankow and Other Open Yangtze River Ports.
Through Bills of Lading Issued to and from Points Beyond Port of Call.

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SERVES THE WORLD — The ROBERT DOLLAR CO.

"TRANS-PACIFIC"
PASSENGER—FREIGHT—REFRIGERATION
WEEKLY SAILINGS between Los Angeles, San Francisco, Honolulu, Yokohama, Kobe, Shanghai, Hong Kong, Manila.

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FORTNIGHTLY SAILINGS between Boston, New York, Havana, Colon, Balboa, Los Angeles, San Francisco, Honolulu, Kobe, Shanghai, Hong Kong, Manila, Singapore, Penang, Colombo, Suez, Port Said, Alexandria, Naples, Genoa, Marseilles, thence Boston.

"INTERCOASTAL"
PASSENGER—FREIGHT—REFRIGERATION
FORTNIGHTLY SAILINGS between Boston, New York, Philadelphia, Baltimore, Norfolk, Los Angeles, San Francisco, Oakland, Alameda and Seattle

"TRANS-PACIFIC FREIGHT SERVICES"
MONTHLY SAILINGS between Los Angeles, San Francisco, Yokohama, Kobe, Shanghai, Hong Kong, Manila, and other ports as inducement offers
BI-MONTHLY SAILINGS between Los Angeles, San Francisco, Pearl Harbor, Guam, Manila, Cavite, Java, Straits Settlements and other ports as inducement offers.

For Complete Information Apply to
DOLLAR STEAMSHIP LINE
ROBERT DOLLAR BUILDING
311 CALIFORNIA STREET, SAN FRANCISCO
Telephone Garfield 4300

CENTRAL BUILDING
LOS ANGELES
Telephone: TRinity 4891

25 BROADWAY
NEW YORK
Bowling Green 3144

Who's Who

(Continued from Page 30)

when in port, young Wollaston took the examinations in the various grades of deck-officer. He is now first officer aboard the Dollar liner President Lincoln. Hanging in his cabin is his master's license, presented this month by Captain John K. Bulger, supervising inspector of the United States Steamship Inspection Service.

After an absence of more than four years, another former San Franciscan has rejoined the ranks of the steamship fraternity in the person of Mose H. Hunt, who is now Pacific Coast manager for the United States Lines.

Mr. Hunt is perhaps one of the best-known steamship men in the United States. He has been in charge of the Shipping Board offices at Los Angeles. When the steamship Leviathan was placed in commercial service, Mr. Hunt, serving with the old Pacific Mail, was prevailed upon to join the largest liner in the world as purser. He served for more than a year aboard the Leviathan and was then sent to the offices in Los Angeles.

Mr. Hunt succeeded H. N. Dunwoody, who has been transferred to the New York offices. H. C. Pike has resigned from the Seattle offices of the Board, and prior to leaving for the East, Mr. Dunwoody will appoint a new executive for the Northern office.

Afloat and ashore there have been several changes in the personnel of the Los Angeles Steamship Company, it was announced by Ralph J. Chandler, general manager.

Albert Bell, formerly with the Panama-Pacific Line, is now purser on the liner Calawaii out of Los Angeles. J. J. Hickey, who has been city ticket agent at San Francisco, has been appointed district passenger agent. Hickey's old berth was filled by L. R. Pember. All principals in the advancements are well known to the travel world.

(Continued on Page 36)

NORTH PACIFIC COAST LINE
JOINT SERVICE OF
Holland-America Line · Royal Mail Steam Packet Company

Between
PACIFIC COAST PORTS
AND UNITED
KINGDOM AND
CONTINENTAL
PORTS

ALL VESSELS
ARE ESPECIALLY
FITTED WITH
REFRIGERATOR
SPACE FOR
CARRYING
PERISHABLES

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120 Market Street — HOLLAND-AMERICA LINE — San Francisco

ORIENTAL

PORTLAND

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
616 Porter Bldg. Phone MAin 4113.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.

OCEAN TRANSPORT CO., LTD.

General Steamship Corporation, agents.
Motoramp Building. Phone Broadway 6714.
FREIGHT ONLY.
SAILINGS—Fortnightly from Portland, Puget Sound, and Vancouver to Japan and North China ports.

OREGON ORIENTAL LINE

(Operating U. S. S. B. vessels).
Columbia Pacific Shipping Company.
Porter Building. Phone Broadway 5360.
FREIGHT ONLY.
SAILINGS—Every 3 weeks from Portland to Orient, calling at Yokohama, Kobe, Shanghai, Taku Bar and Dairen, returning via San Francisco.
Every 2 weeks from Portland to Yokohama, Kobe, Hongkong, and Manila, returning direct to Portland.

TATSUUMA KISEN KAISHA

Walker Ross, Inc., General Agents.
Board of Trade Bldg. Phone Broadway 7574.
FREIGHT ONLY.
SAILINGS—Monthly from Portland to Yokohama and Kobe; or Osaka, Nagoya as inducements offer.

YAMASHITA KISEN KABUSHIKI KAISHA

Yamashita Company, 1109 Porter Building.
FREIGHT ONLY.
SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe, and irregular service from China and Japan ports to San Francisco, Portland, and Seattle.

VANCOUVER

BLUE FUNNEL LINE, LTD.

Dodwell & Co., Ltd., agents.
Yorkshire Building. Phone Seymour 9576.
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Vancouver, Victoria, and Seattle to Yokohama, Kobe, Miike, and Hongkong.

CANADIAN PACIFIC STEAMSHIPS, LTD.

Canadian Pacific Railway Station. Phone Seymour 2630.
PASSENGERS AND FREIGHT.
SAILINGS—Every 14 days from Vancouver to Japanese ports, Shanghai, Hongkong, and Manila.

OSAKA SHOSEN KAISHA

Empire Shipping Company, Ltd.
815 Hastings St., W. Phone Seymour 8014.
PASSENGERS AND FREIGHT.
SAILINGS—Every 2 weeks to all ports in Japan and China, also Vladivostok, Singapore, Bombay, etc.

SUZUKI & COMPANY, Ltd.

B. L. Johnson, Walton & Company, agents.
837 Hastings street, W. Phone Seymour 7147.
FREIGHT ONLY.
SAILINGS—Irregular service between Pacific Coast ports and Japan ports.

WALKER-ROSS, INC.

FREIGHT ONLY.
SAILINGS—Regular service to Yokohama, Kobe, Osaka, and Nagoya.

YAMASHITA KISEN KABUSHIKI KAISHA

Yamashita Co., Inc.
Merchants Exchange Building.
FREIGHT ONLY.
SAILINGS—Every 2 weeks to Yokohama, Kobe, Osaka, and Nagoya.

UNITED KINGDOM—Continental Europe

SAN FRANCISCO

EAST ASIATIC COMPANY, LTD.

The East Asiatic Company, Inc., agents.
433 California street. Phone Davenport 6717.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast ports, direct to Hamburg, Hull, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.

Norton, Lilly & Company, general agents.
230 California street. Pone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Monthly from Vancouver, Puget Sound, Portland, San Francisco, Los Angeles, San Diego to Liverpool, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports, via Hull.

FRENCH LINE

(Compagnie Generale Transatlantique).
General Steamship Corporation, sub-agents.
240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Fortnightly from Vancouver, Seattle, Portland, San Francisco and Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE

Furness, Withy & Company, Ltd.
Furness (Pacific), Ltd.
710 Balfour Building. Phone Kearny 8660.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Vancouver, Seattle, Tacoma, Portland, San Francisco and Los Angeles to London, Liverpool, Manchester, and Glasgow.

GENERAL STEAMSHIP CORP.

240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—From Pacific Coast ports to London, Hull, Leith, Scandinavian, and Irish ports as inducements offer.

HARRISON DIRECT LINE

Balfour Guthrie & Company.
351 California street. Phone Sutter 6427.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco, Oakland, and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES

E. C. Evans & Sons, general agents.
260 California street. Phone Davenport 8040.
FREIGHT ONLY.
SAILINGS—Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, and Los Angeles to London, Liverpool, Avonmouth, and other United Kingdom ports as inducements offer.

JOHNSON LINE

W. R. Grace & Co., general agents.
332 Pine street. Phone Sutter 3700.
PASSENGERS AND FREIGHT. (Refrigeration.)
SAILINGS — Monthly between Pacific Coast ports and Bergen, Oslo, Gothenberg, Malmo, Copenhagen, Stockholm, and Helsingfors

NAVIGAZIONE LIBERA TRIESTINA

General Steamship Corporation, agents.
240 Battery street. Phone Kearny 4100.
PASSENGERS AND FREIGHT.
SAILINGS—Mediterranean Service.
Monthly sailings from Pacific Coast ports to Trieste, Leghorn, Genoa, Naples, and Barcelona; also Canary Islands.
PASSENGERS AND FREIGHT.
SAILINGS—African Service.
Monthly from Pacific Coast ports; through bills of lading being issued for principal ports of West, East, and South Africa, with transshipment at Genoa or Naples.

NORTH PACIFIC COAST LINE

(Joint service of the Royal Mail Steam Packet Company and Holland America Line).
120 Market street. Phone Douglas 7510.
PASSENGERS AND FREIGHT.
SAILINGS—Every 2 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Oakland, Los Angeles, and Liverpool, London, Rotterdam, Antwerp, Hamburg, Southampton, Glasgow.

NORWAY PACIFIC LINE

485 California street. Phone Sutter 5099.
FREIGHT ONLY.
SAILINGS—Every 30 days from San Francisco and Los Angeles to United Kingdom, Continental ports and Scandinavia.

SOCIETE GENERALE DE TRANSPORTS MARITIMES A VAPEUR

Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—From Seattle, Portland, San Francisco, and Los Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES, INC.

Sudden & Christenson, Pacific Coast agents.
230 California street. Phone Garfield 2846.
For passengers. Phone Sutter 46.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Vancouver, Seattle, Portland, San Francisco, and Los Angeles, to Antwerp, Hamburg, and Bremen; with call at United Kingdom ports when inducements justify.

SEATTLE

EAST ASIATIC COMPANY, LTD.

The East Asiatic Company, Inc., agents.
1222 Alaska Building. Phone ELiot 9104.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast ports direct to Hamburg, Hull, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.

Norton, Lilly & Company, general agents.
Alaska Building. Phone ELiot 2450.
FREIGHT ONLY.
SAILINGS—Monthly from Vancouver, Puget Sound, Portland, San Francisco, Los Angeles, San Diego to Liverpool, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports, via Hull.

FRENCH LINE

(Compagnie Generale Transatlantique).
General Steamship Corporation, agents.
Colman Building. Phone ELiot 5706.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE

(Furness, Withy & Company, Ltd).
Furness (Pacific), Ltd.
Burchard & Fisken, Inc., agents.
705 Arctic Building.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Vancouver, Seattle, Tacoma, Portland, San Francisco and Los Angeles to London, Liverpool, Manchester and Glasgow.

GENERAL STEAMSHIP CORP.

Colman Building. Phone ELiot 5706.
SAILINGS—From Pacific Coast ports to London, Hull, Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE

Balfour, Guthrie & Company.
Dexter Horton Bldg. Phone ELiot 1464
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco, Oakland, and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES

Norton, Lilly & Company.
Alaska Building. Phone ELiot 2450.

JOHNSON LINE

Direct Freight and Passenger Service
To and From
PACIFIC COAST PORTS — SCANDINAVIAN PORTS
Hamburg and Other European Ports as Inducements Offer
Through Bills Lading Issued to All Scandinavian, Finnish & Baltic Ports

MONTHLY SAILINGS
Vessels Call at Antwerp Outward From Europe

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EXPRESS FREIGHT AND PASSENGER SERVICE TO AND FROM
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Los Angeles—San Francisco—Puget Sound—British Columbia—Monthly Sailings

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San Fernando Bldg.

PORTLAND
LIDELL & CLARKE

SEATTLE
W. R. GRACE & CO., Agts.
Hoge Bldg.

VANCOUVER, B. C.
C. GARDNER JOHNSON, Agt.

FURNESS LINE
"THE UP-TO-DATE REFRIGERATOR SERVICE"

Express, Freight and Passenger Service

Pacific Coast Ports *to*
United Kingdom and Continent
FURNESS [Pacific], Ltd.
Pacific Coast Agents
VANCOUVER SEATTLE PORTLAND
SAN FRANCISCO LOS ANGELES

Who's Who

(Continued from Page 34)

Captain Carl A. Heygendorf, who was recently selected by the board of Harbor Commissioners as chief port pilot for Los Angeles harbor, had been, until his pilot's berth, a follower of the sea for more than thirty years. He served with the Union Oil Company for many years as commander of the tanker Lansing. During the war he was master of the U. S. Collier Nanshan, running between San Francisco and the Canal. Captain Heygendorf replaced Pilot T. D. McFarland, the latter, however, remaining with the San Pedro pilot body.

Few appointments could be made in the maritime world that would please the fraternity more than the selection of Kenneth Dawson to become a member of the Board of Harbor Commissioners at the Port of Portland. Mr. Dawson has been a member of the Columbia Pacific Shipping Company for many years and has always been one of the most active figures in Oregon's development of her maritime trade.

Captain Valentine J. Green, a familiar figure on the bridge of intercoastal liners in Pacific Coast ports, has left the sea to assume the position as a marine surveyor at the port of New York. Captain Green served on coast to coast vessels of the Panama-Pacific Line.

Robert A. Smith, formerly chief officer of the Panama-Pacific liner Manchuria, is now skipper of the freighter Montana. Theodore C. Christenson succeeded Captain Smith on the Manchuria, while James E. Lee was advanced to the position of first officer.

After an inspection tour of Pacific Coast offices, Earl B. Hull, traveling inspector of the United States Steamboat Inspection Service, with headquarters in Washington, D.C., is en route home. Captain Hull was feted by Captain John K. Bulger, chief of the inspection service at San Francisco, and leading steamship executives.

Surveys and Gauges of Bulk Oil Shipments

(Note: The following article, a service bulletin for underwriters and others interested in bulk oil cargoes, is contributed by P. W. Tompkins, of Curtis and Tompkins, industrial chemists of San Francisco.)

IN CONNECTION with bulk oil shipments, it may be of interest to review a few fundamental features of surveys and gauges which merit careful consideration. So much depends on the thoroughness of this work that we cannot avoid referring to the subject at some length, in order to foster a better understanding of what is truly involved. What first naturally comes to mind is what causes discrepancies between the shipping weight and outturn where no leakage has occurred.

Gauging the Quantity of Oil

Some of these differences can be ascribed to inexperienced persons doing the work, on the one hand, and, on the other, to inaccurate calibration of land tanks and delivery barges and sometimes to the delivery being based on the estimated capacity of ship's tanks which are notoriously inaccurate and the least accurate of all methods of determining a delivery. Where the amount of oil loaded is based on actual weight, the comments that follow would not apply, but where it is determined by measurement through gauges of land tanks, barges, or ship tanks, it is subject to numerous errors if not very competently handled.

Shore tanks and barges are necessarily gauged empty and calibrated for every 1/4 to 1/8 inch, as the case may be, in terms of cubic feet or gallons of water, usually at 60 degrees Fahrenheit, and if the results are to be at all representative, the work must be infinitely precise. Outages and oil measurements at the point of loading are taken shortly after pumping is completed when the oil is full of air and a thickness of foam usually on the surface. Outage or innage measurements taken at this time are bound to indicate more oil than is actually present, since the foam on top and the air in the oil increase the true measurements, making the tank or barge appear to contain a greater depth of oil than is the fact. In other words, to obtain accurate data, it is necessary to remove the foam before measurements are taken and also to allow air to escape, as otherwise excessive figures result, sometimes to the extent of an indication of several tons more oil than if measured 12 to 24 hours later when oil has subsided. This point has been practically demonstrated over and over again. For this reason it is preferable (whenever possible) never to measure the oil in land tanks until it has stood at least 24 hours, which allows time for air to escape and the foam to settle. However, allowing it to stand in this way is rarely possible and seldom followed at point of loading and is one of the reasons that shipping figures are often excessive.

The matter of temperature and the way it is procured is also of importance in comparing measurements of shipments arriving at different temperatures, as it requires corrective computations in expansion and contraction. Consequently those with a fundamental knowledge of engineering and mathematics should supervise these gauges. Under the most accurately controlled conditions, the error in determining the weight of large bulk oil shipments through the medium of measurements (not weighing) should not exceed 0.2 per cent. Based on a 600-ton shipment accurately gauged by skilled hands, even this 0.2 per cent allowable experimental error would in itself represent about 1.2 tons (plus or minus), but if inaccurately done or in unfamiliar hands would be much more.

Surveys

In the matter of surveys, there is little real understanding of requirements. The extent and character of the survey should be governed somewhat by the nature of the clauses insuring against shortage. For instance, if an insurance policy covers shortage in excess of 1 per cent **due to leakage only,** it necessitates a number of measurements and computations to give the mathematical proof to distinguish shortage due to non-delivery from that due to leakage, or the proportion due to each cause. On the other hand, a policy which covers **all** shortages in excess of 1 per cent, eliminates much work in the way of measurements and computations which would be required in the first mentioned case, and practically the only requirement is to accurately establish the outrun weight. It must therefore become apparent that in order to proceed intelligently and not do the unnecessary, these clauses should be known in advance.

A further important phase of the survey is the advisability of continued attendance through the entire discharge (standing by night and day) to guard against contingencies or mishaps which might occur. In this event, the cost is naturally regulated by the duration of the discharge and the time spent at night, both in turn fluctuating according to the size of the shipment. In our opinion, no survey is complete without continued attendance during the entire discharge, which, though in many cases unnecessary, has on frequent occasions proved most expedient and without which settlement of claims arising from mishaps would not have been possible. It is of course perfectly obvious that where everything runs smoothly and no trouble develops a careful survey is of no more use than the most superficial one, but when trouble arises, the presence at that time of experienced persons to act at the moment is a great protection to those concerned and fixes the responsibility.

This phase has been most strikingly illustrated on several occasions. In the case of the Royal Arrow, where a shortage of 26 tons of coconut oil was involved, several survey reports were turned in, but as they disclosed few essential facts, proved of little value. As a result, all reports were turned over to us as umpires to determine what actually happened. With additional measurements and data independently procured by us, we were able to prove an error in the Manila surveyor's report which was responsible for the discrepancy and that the shortage was a case of non-delivery.

When a survey is only to include sampling the ship's tanks, taking temperature and outages and no other attendance until finally inspecting the tank for complete discharge of oil and evidences of leakage, together with the usual statement concerning these items, the work and consequently the charge is greatly reduced. Those requiring this so-called survey, naturally understand that they assume responsibility for all occurrences in the interim (period of non-attendance) incident to the discharge.

An oil survey requires a high type of technical knowledge. With many surveys, the absence of this special knowledge explains why more oil is sometimes reported loaded than is found on discharge, and is also responsible for overages being received when less oil has been reported shipped. We have already referred to a survey which reported 26 tons of coconut oil which was never loaded, and can also cite numerous surveys where considerably less oil was reported shipped than was actually received. One case alone will emphasize the point, where 24 tons more coconut oil was received than the Oriental survey showed was loaded.

Take, for example, the apparently simple matter of comparing one outage with another to see if any leakage has taken place in a ship's tank during transit. How simple this seems—just subtract one set of figures from the other and you have it, but how different if done correctly. Unless the list, draft, and temperature by chance happen to be nearly alike both at point of loading and of discharge, it is not possible to make direct comparison. Under any other condition outages cannot reveal the facts until they are corrected by elaborate computations which will bring the two sets of conditions to an equal or uniform basis which permits making direct comparison. Then and not till then, can any authentic deduction be made leading to decisions regarding indicated leakage or the proof of leakage.

This subject of oil surveys and gauges must be regarded as a special business for which a fundamental knowledge of engineering, mathematics, and chemistry of oils is required.

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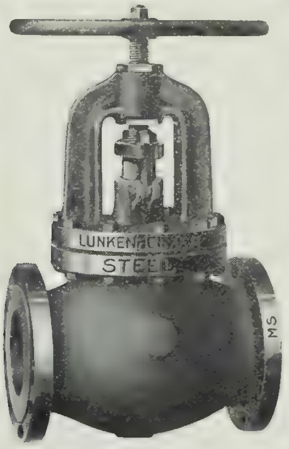

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Pacific Marine Review

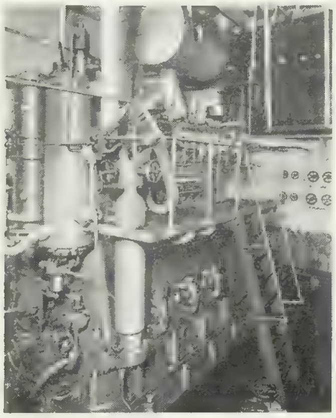
The National Magazine of Shipping

April, 1927

From Times, New York City
Feb. 1, 1927

Board Buys More Diesel Engines.

The receipt of a fourth repeat order for auxiliary Diesel oil engines from the United States Shipping Board was announced yesterday by the Worthington Pump and Machinery Corporation. This brings the total of Diesel auxiliaries ordered from Worthington since April, 1925, to twenty-one. The engines are all two-cycle, single-acting Diesels of the air-injecting type, and are employed for operating engine-room and dock machinery and supplying electricity for lighting purposes.



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TUG "NORWOOD"

Seattle, Washington,
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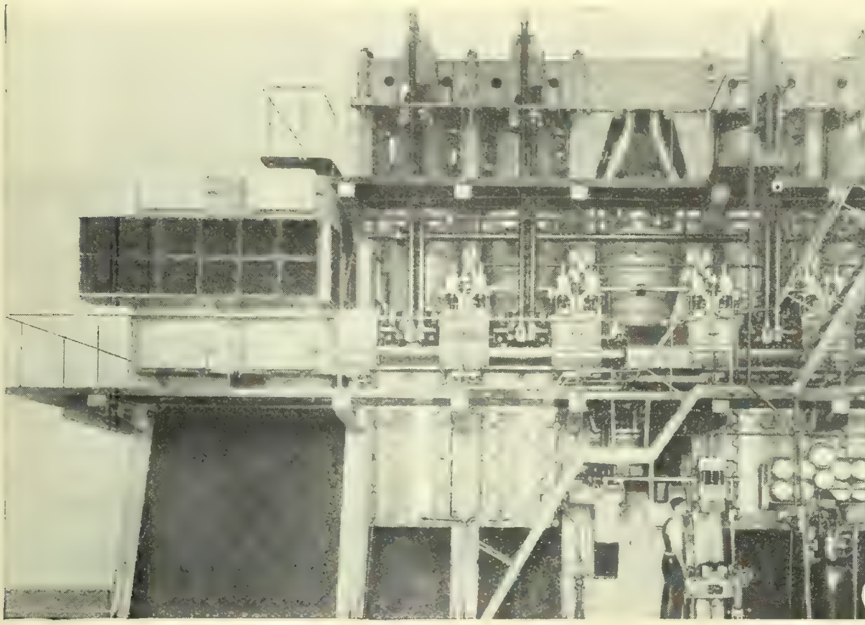

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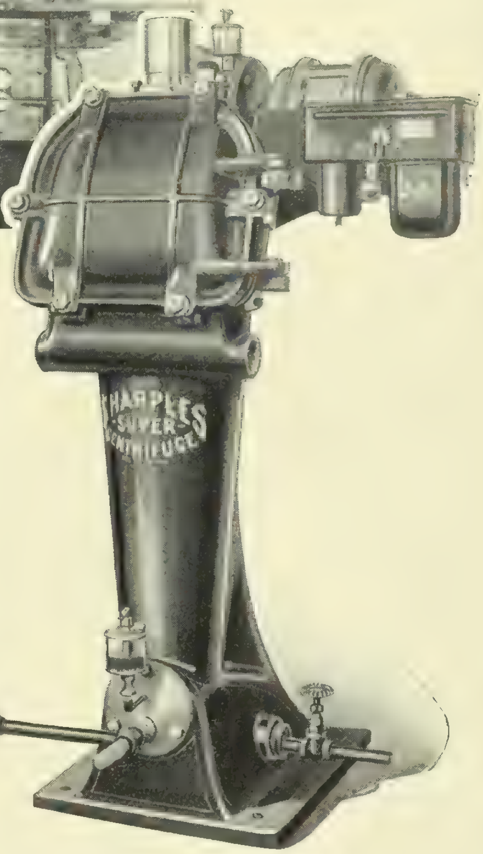

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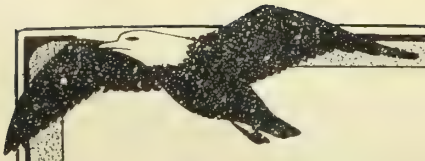
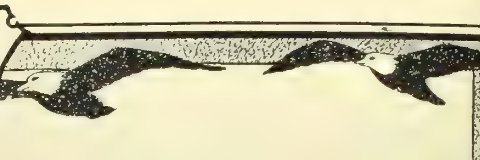
Pacific Marine Review





CONTENTS

April 1927

Government Aid to Shipping, by Norman F. Titus 157
A world-wide review of a subject of immediate and vital importance to the American people.

The Carquinez Bridge 161

Handling Cylindrical Loads 162

The New Ship Radio Beacon 163

The Diesel-Electric Dredge Clackamas, by James H. Polhemus 164
World's largest diesel-electric suction dredge shows remarkable maintenance and fuel economies.

Bottom Repairs of Steamship Solana, by G. B. Newby 169

Oil Burning Hints, by George W. Wallace 170
Notes on the management of marine boilers.

Use of High Pressure Steam in Marine Power Plants, by H. L. Seward 172

The Basic Principles of Advertising in Foreign Trade, by Frederick Sturgess 175

Is Ship Fumigation a Logical Government Job? by Roy W. Kelly 176
A discussion of government methods and some fumigation troubles.

Hamilton-M.A.N. Double-Acting Diesel 178
The Hooven, Owens, Rentschler Company 3300-horsepower unit successfully completes U. S. Shipping Board thirty-day non-stop test.

A Novel Light Weight Diesel (Foos) 180

Pacific Workboats and Their Power Plants:

Workboat and Engine Notes 181
Hall-Scott Heavy Duty Marine Motors 183

Auxiliaries, Ship Supplies, Marine Equipment:

Complete Auxiliary Power Plant 184
Buffalo Engine 184
Refrigeration for Fishing Boats 185
An Efficient Bearing for Hard Service 186
The Pyle-National Turbo-Generating Set 187
Fire Protection on Small Boats 187
A New Oil-Tight Paint 187
New Sales Manager for American Engineering 189
C. V. Lane, Successor to Ford and Geirrine 189
Two Rhodes Specialties 189
Monel Metal Shafting 190
Hammered Iron Piston Rings 196
Rubber Lumber 196
Double Seal Piston Rings .... 14 Adv. Sec.

Marine Insurance 191

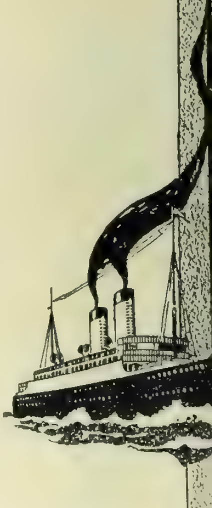
American Shipbuilding 197

Pacific Trade and Traffic:

Pacific Coast Foreign Trade ....11 Adv. Section
Pacific Trade Tonnage ....11 " "
Pacific Port Construction Notes ....13 " "
Page Bros. Freight Report ....19 " "
Shipping Board Competition ....19 " "
Masters, Mates, and Crew ....23 " "
Hands Across the Sea ....23 " "

Of a General Nature:

Shell Group Insurance 186
Trade Literature 186, 188, 190
How to Seize Wire Rope 190
Stettinius Honored .... 14 Adv. Section
Who's Who Afloat and Ashore .... 24 " "



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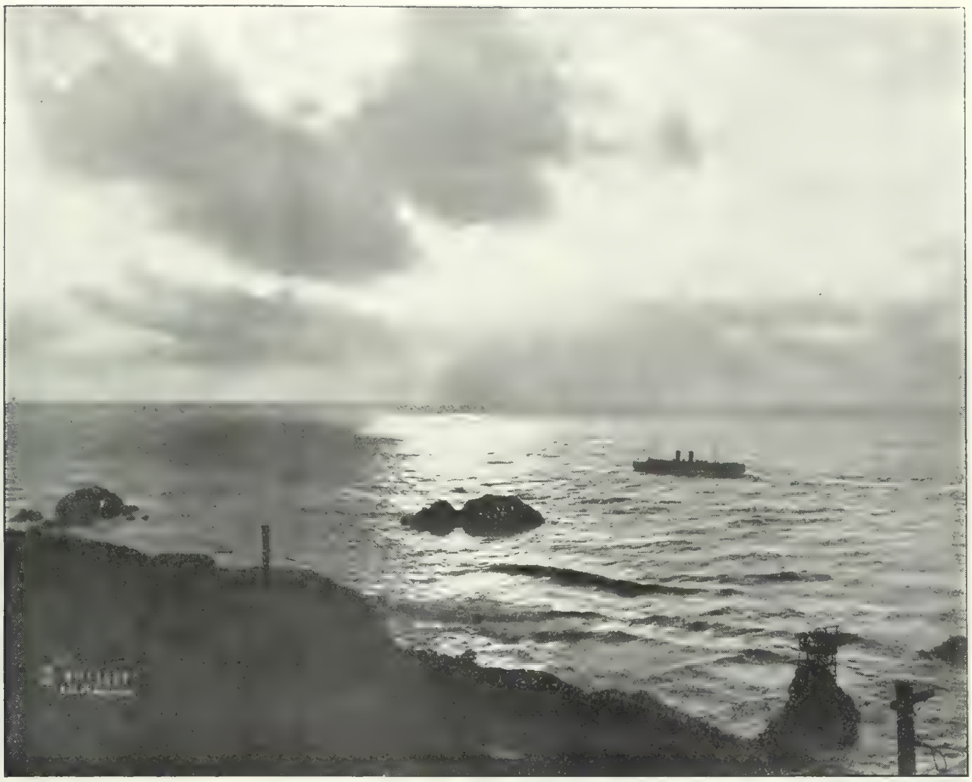

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APRIL, 1927 Vol. XXIV. No. 4

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Official Organ Shipowners' Association of the Pacific

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Paul Faulkner, Advertising Manager

Government Aid to Shipping

A World-Wide Review of a Subject of Immediate and Vital Importance to the American People

By Norman F. Titus, Chief, Transportation Division, Bureau of Foreign and Domestic Commerce.

EVERYTHING seems to point to an approaching crisis in our shipping affairs. World shipping seems to be entering a period of prosperity, and foreign nations apparently are exerting every effort to place their merchant marines in the best possible shape for the world struggle for business. The increasing launching of diesel-propelled vessels and the advent of a new type of cargo-liner of great size and speed are all evidences of developments of the utmost significance.

In line with this situation it is increasingly important that the United States set its shipping house in order and decide on some form of a definite merchant marine policy. At the close of the last session of Congress, Senator Jones introduced two bills affecting the American merchant marine—one aimed at private ownership and operation and the other a plan for government ownership and operation. These bills died with the close of Congress, but Senator Jones stated that he anticipated this and merely introduced the bills at this session in order to bring them to the attention of the American public and that he intended to re-introduce them at the next session of Congress next December and force action upon them. Evidently the stage is all set for some sort of decision concerning this very vital matter of our merchant marine policy.

The Jones bill for private ownership and operation contemplates government aid to the operator, while the bill for government ownership and operation has in mind a huge construction program savoring somewhat of our war-time activities along shipbuilding lines. Obviously at this time it would be timely to review the proposition of government aid as practiced by nations throughout the world; such a review should be of assistance in making up our minds concerning Congressional action next winter.

A world review of government aid should take very briefly into consideration the history, legislation, and contracts by which maritime nations sought to strengthen and develop merchant shipping under their flags before the outbreak of the World War, and such a review should also take into account the shipping conditions resulting from the war with particular reference to the methods by which the nations have adapted themselves to these new conditions, and it should include a statement of the developing influences and the formulated policies concerning merchant shipping. Such a world review follows.

UNITED STATES

A review of American shipping factors indicates that the United States has more ports than any other country in the world; that the freight available for the coastwise trade is enormous; that the commerce of the Great Lakes far exceeds other inland waterways, including the Suez Canal; and as a consequence of such, an adequate merchant marine was not only necessary but imperative. When the law reserving coastwise trading privileges to American flag vessels was passed, the tonnage engaged in the coastwise trade increased. Likewise so did the Ship Registry Act of 1914 increase the size of the American merchant fleet. The Seamen's Act of 1915, although creating new operating conditions, furnished a protective power to American shipping which had previously been neglected. The Shipping Act of 1916, creating the United States Shipping Board, designated the Board to investigate the methods of American and foreign steamship lines; their connections with one another and with rail carriers; the granting of rebates; their subsidies; the effect of pool combinations and working agreements upon the commerce and ocean freight rates of the United States; and also provided the authority to create a corporation for the operation of vessels on behalf of the United States. The purpose of the investigation was to frame legislation for the regulation of the rail carriers by the Interstate Commerce Commission. In the interim between the passing of this Act and before the Shipping Board actually began to function, the United States entered war. In a series of acts passed during the war period, 1916 to 1923, Congress authorized expenditures by the Shipping Board amounting to $3,491,000,000 for the purpose of purchasing, requisitioning, constructing, or otherwise acquiring ships and shipbuilding contracts in order to meet the war emergency. In addition to the above sums, the largest naval appropriation bill in our history was passed, which called for an expenditure of $588,000,000. Due to the influence of the war, the merchant marine of the United States increased approximately 8,275,000 gross tons.

The Merchant Marine Act of 1920 is the first and only legislative effort thus far completed to settle the future of the government merchant marine. Under the Act, the Shipping Board was granted full power and authority to complete or conclude any construction work begun under the war legislation; to sell its property, buildings, etc., as well as its ships, or to continue to operate the government fleet as it deemed advisable. The Act dealt also with marine mortgages, marine insurance, classification of vessels for insurance purposes, and details as to terms of sale or operation; it also extended the coastwise trading laws of this country to include certain insular possessions, as well as afforded special exemptions to shipowners from taxation, and likewise it created proportional rail rates for exports in American ships. This, as well as some of the other regulations of the Act, have not yet been put into operation. Shortly after this, the Merchant Marine Bill of 1922 was passed by the House but not the Senate. This bill would have modified the Act of 1920 and had for its main contributory value the issuance of general navigation bounties.

In the history and development of the shipping industry in this country, no direct aid in the way of subsidies or bounties was ever offered American shipping. Indirect aid has been obtained through the reservation of the American coastwise trade to American flag vessels, the admission of foreign constructed vessels to American flag registry, and the free importation of materials for the construction or repair of ships, although this aid was vitiated by the Tariff Act of 1922.

The only direct financial aid which the government has granted its merchant shipping has been in the form of postal subventions to specified lines operating in specified routes in the foreign trade. At no time has this country paid a general bounty on the construction or operation of ships similar to the bounties paid in France, Italy, Spain, and certain other countries. The policy of granting financial aid to merchant shipping is said to have been instituted by the law of March 3, 1845, which authorized the Postmaster General to contract with American shipowners for the transportation of mails between ports of the United States and foreign ports not less than 3000 miles distant; to any of the West Indian Islands or islands in the Gulf of Mexico; and between ports of the United States along the coast.

BRITISH EMPIRE

Great Britain

The British merchant marine was originally created by individual initiative although since 1914 the British Government, under the stress of war, not only acquired full control and direction of all serviceable British shipping, but by cooperation with the Allies and the United States, secured the establishment of an Allied Maritime Transport Council Executive, which, at least in an advisory capacity, suggested the direction of the daily employment of ninety per cent of the seagoing tonnage of the world, including much of the tonnage of the neutral states. Likewise, the British Government built approximately one million gross tons of merchant ships and acquired possession of and title to 2,380,000 gross tons as prizes or reparations. This enormous merchant marine, larger than that of any country before the war, has been sold to private shipowners, and individually the various measures of government control have been eliminated until the relations of the British Government to its merchant shipping are apparently as they were in 1914 and years preceding it and the status of British shipping has again reverted to individual initiative for its development.

The indirect aid provided British shipping has been chiefly the exemption of import duties of foreign-built ships which have been granted the privilege of British registry since 1849 and the loan made to the Cunard Steamship Company in 1903 which enabled it to construct two large steamers to be used in the transatlantic trade. The coastwise trade of Great Britain since March 23, 1854 has been open to ships of every nation affording British ships a corresponding privilege.

Generally speaking, Great Britain has at no time in its history ever paid a general bounty on the construction or operation of merchant ships. Its financial aid has been limited to the payment of fixed amounts for the regular transportation of British and colonial mails on specified routes by companies with which special contracts have been made. In certain instances in the colonial trade the subsidy is paid by the United Kingdom, although in other instances it is contributed to in part by the colonies.

Great Britain also has an Admiralty subsidy to provide naval auxiliaries and reserves.

Canada

During the war the Canadian Government acquired a merchant marine which is operated in the same manner as the Dominion operates its railroads. The only form of subsidy granted by the Dominion was for the carriage of mail. This subvention has been changed radically in both its transatlantic and transpacific services since the pre-war period. Whereas, in the pre-war era, the Canadian Government awarded annual contracts for the carriage of mail, at the present time it pays for the mail according to the space occupied, using such steamers as from week to week are found most suitable for the service. The coastwise trade of Canada is open to vessels of all nations extending the same privileges to British ships.

Union of South Africa

While the Union of South Africa operates no merchant marine, it does engage indirectly in subsidization. In conjunction with the United Kingdom, it has granted a subsidy for the carriage of mail and maintenance of a regular service between South Africa and the United Kingdom. The Union also has cooperated with the United Kingdom in furthering projects for imperial preference. The coastwise trade of South Africa is open to the vessels of all nations extending similar privileges to British ships.

Australia

The Australian Commonwealth owns and operates a merchant fleet which was a development of the war. In the pre-war period Australia awarded subsidies for the carriage of its mail, but it has now terminated practically all of them and relies for the most part on the Government Merchant Marine for its carriage. In some trades, however, it has not been possible to entirely eliminate the subvention of the mail service. The coastwise trade of Australia is open to the ships of any nation which admits British ships to its coasting trade. This was somewhat modified in 1921 by an amendment to its Navigation Act which requires certain specific performance of vessels operating in this trade.

SCANDINAVIAN COUNTRIES

Denmark

Financial aid extended by the Danish Government to its shipping has not been extensive. However, development has not been retarded on this account, nor can it be said that any increase of its tonnage was due to the governmental aid that was rendered it. Some of the most important subsidies to steamship companies have been developed primarily for agricultural exports to Great Britain; namely, the subvention of a service operating between Denmark and England for the carriage of Danish dairy and farm products at a 20 per cent reduction in rates. Indirect aid has been afforded shipowners by the free admission to registry of foreign built ships and by granting a drawback not to exceed 2 per cent of all vessels built in Danish shipyards in case of duties paid on imported materials used in construction of such vessels. The government also for many years refunded wharfage charges paid at the port of Esbjerg to vessels operating on the subsidized lines. The coastwise trade of Denmark is open to all nations granting reciprocal privileges to Danish shipping, with the exception of Sweden. Likewise certain mail subsidies have been granted to individual steamship lines.

Norway

The Department of Commerce has general charge of the administration of Norwegian shipping laws, and government aid is paid only to steamships which conform to the government's specifications and after a complete investigation is made of each company. Companies receiving this subsidy must continue in operation for three months after the end of the fiscal year for which the subsidy is granted and during this period perform the services required by the Department. While they are in receipt of aid they are prohibited from acquiring reserve funds for depreciation, etc., out of current expenses, and are taxed in the same manner as nonsubsidized companies. Steamship lines receiving government aid are required to carry members of the Norwegian Congress free of charge. The govenment subsidizes services between specific ports in addition to the subsidy paid for the carriage of mail. The coastwise trade of the country is open to vessels of all nationalities except those of Sweden. Indirect aid is also given to shipbuilders by the practice of paying fixed sums as reimbursement for duties paid on the imports of materials used in ship construction.

Sweden

The development of the merchant marine of Sweden is due only in a small degree to government aid. Indirect aid is given to the shipowners by the admission to Swedish registry of foreign constructed ships; by the allowance of drawbacks on imported materials used in shipbuilding; and by providing construction loans to steamship companies on favorable terms. The coastwise trade of Sweden is open to the ships of all nationalities excluding those of Norway. Sweden for a long time has paid subsidies for the maintenance of regular services in addition to the mail subsidies.

JAPAN

The development of Japan's merchant marine is due in part to the large amount of government aid rendered the shipping industry. Prior to the war, the shipbuilding industry was encouraged directly through the shipbuilding bounty law and indirectly through the navigation bounty law. The former made it possible for corporations whose members or shareholders were Japanese subjects to receive a bounty varying with the type of vessel, providing such was constructed in accordance with the requirements of the authorities. Various restrictions were placed on the material entering into the construction of vessels on which bounties were paid. Materials of foreign manufacture were limited to certain specific types and the remainder was required to be of domestic manufacture. In 1918 this shipbuilding bounty law was suspended by the government. In the meantime a law was enacted for the purpose of encouraging the steel industry by providing bounties for various domestic steel products. In this way an indirect aid was afforded to the shipbuilding industry. The navigation bounty is so worded as to favor Japanese-built ships, as for example the addition of 25 per cent to a navigation bounty in the case of ships built according to the plans approved by the government. These navigation bounties are used for the carriage of mail in specific trade routes. In 1920 the former use of navigation bounties was changed by the authorization of a system of postal subsidies. As a consequence of this, in the well developed trade routes a system of mail payments has been instituted, while in other routes not so well developed, and in the coastwise and neighboring trades, the old system still prevails.

FRANCE

France has made great use of bounties and subventions for the upbuilding of her merchant marine. Indirect aid has been offered by reserving the coastwise trade to vessels under the French flag; the limitation to ships of French registry of the entire trade between France and Algeria (which was modified slightly to provide that in emergencies this restriction may be suspended); the exemption from import duties of shipbuilding material; the imposition of import duties upon foreign-built ships and shipbuilding materials; preferential railway rates in favor of French navigation companies; and loans to shipowners for shipbuilding enterprises. Direct aid was afforded in the form of navigation bounties up until 1918 when they automatically expired and have not been renewed. Mail subsidies are offered in specific trade routes, the intent being to maintain regular mail connections between France and its protectorates and colonies.

ITALY

Italy was one of the few countries that increased its shipbuilding facilities through the acquisition of steel shipbuilding plants established before the war. It has afforded indirect aid to its shipping by reserving the coastwise trade of the country to ships of Italian register; by the exemption from import duties of all foreign built vessels imported for use in navigation on lakes and rivers as well as ocean navigation; the free importation in certain instances of naval equipment and shipbuilding supplies; a refund of Corinth Canal dues paid by ships operated in that trade in exchange for the free carriage of mails; as well as other similar aids.

Direct aid was afforded by the granting of construction and repair bounties and the exemption of income tax and excess war tax for a period of five years on ships constructed in Italy, and for three years on those built abroad but registered in Italy on or before a specific date. The 1918 Shipbuilding Decree was passed at a time when Italian shipping was at its lowest ebb. It provided, among other things, that Italian-built ships registered between January 1, 1920, and June 30, 1921, and ships built abroad and registered in Italy before December 31, 1920, should be entitled to a government charter for two years from their registry. The charter provided on its expiration for the amortization by the government of the excess war cost of the ship, according to an elaborate schedule, and if the market value of the ship should be less than the scheduled compensation, the state should also pay the difference.

On March 30, 1919 the De Nava Decree was passed to end the system of bounties granted by the Villa Decree but it actually extended the provisions of the Villa Decree for a period of 10 years with the exception that the government's obligation to charter new ships for 2 years would end on June 30, 1921, and in the case of ships registered after that date charters were to be optional with the government. The Decree also provided a modified statement of state payments to shipowners to compensate for excess war costs of shipbuilding. On September 25, 1921, the so-called Belotti Decree was issued providing that ships 30 per cent completed on June 30 of that year should be granted a bounty of 900 lire per gross ton; 180 lire was to be paid when the ship was completed and the remaining 720 lire in 24 monthly installments after the ship had entered service. In addition ships were exempt for 5 years from income taxes, and those which were built in Venetia Guila were exempt from industrial taxes and also from possible government requisition for 4 years. The Decree also provided that shipyards established or enlarged between August 23, 1918, and October 31, 1920, were entitled to a depreciation not to exceed 68 per cent of their expenditures on establishment or development during that period.

When the government changed in October, 1922, the subsidies were modified to a great extent. The system set up during the war under which the government chartered the steamships, subsidized the lines, or made good their operation was abandoned. Likewise various government-owned and operated services were transferred to private ownership. In March, 1923, the various subventions formerly granted by the government were consolidated into 19 contracts, practically all of which were in neighboring trades. Under the terms of these contracts the most important items are, that all mail must be transported free including parcel post packages up to 5 kilos in weight; freights and fares must not exceed those charged by competing lines; freights and passengers carried on state account are entitled to a 30 per cent reduction in rates; and the state is to exercise a general supervision over the receipts of the company.

NETHERLANDS

The Netherlands, like all other countries possessing colonies, through necessity had to maintain direct communication with them, and it is only natural that subsidies were granted to steamship lines operating in these colonial routes. In certain instances half of the subsidy was paid by the Netherlands government and half by the colonial government. Generally these subsidies were based on the carriage of mail between the home country and the colonies. Formerly preferential duties were offered the shipping companies in the trade between The Netherlands and the Dutch East Indies and lower duties were established on imports carried in Dutch vessels although this has since been abolished. Foreign constructed ships, as well as foreign materials used in the construction of seagoing ships, may be imported free of duty. Various services are now subsidized based on the carriage of mail.

BELGIUM

It is pointed out that although Belgium ranks sixth among the nations of the world in respect to its trade, its merchant marine ranks sixteenth. It is thought by some that this is due to the disinterest of the Belgium people to seafaring life. Before the war Belgium offered shipping companies the following indirect aid: Reservation of the coasting trade; exemption from import duties, pilotage fees, light duties, etc.; preferential rail rates; and the issuance of loans to shipping companies. The direct aid then granted consisted exclusively of postal subsidies in the form of a refund of pilotage duties to steamship lines operating over certain specific routes. The contracts made at this time were with German lines which have not been resumed since the war. Belgian mails are now carried at the International Postage Union rates. Recently the government has taken an active interest in the creation of a merchant marine through the Lloyd Royal Belge. The company was capitalized at 50,000,000 francs and the Belgian treasury was authorized by law to guarantee amortization on its bonds for 100,000,000 francs as well as to take over 75,000,000 francs worth of these bonds which were issued in 1920 and the balance in 1921. The government appointed two commissioners to supervise the company and requires that two-thirds of its tonnage be run on regular lines. Ships cannot be transferred to foreign registry without the authorization of the commissioners. Other provisions have been incorporated into the terms, so that it constitutes a shipping company actively supported by government aid.

GERMANY AND AUSTRIA-HUNGARY

Germany

In the early periods of Germany's growth maritime adventures did not appeal to the emperor and it was not until after Germany had set up its colonies that it first actively engaged in the establishment of a merchant marine. From that time on, it progressed rapidly. At first only indirect aid was afforded German shipowners, such as free admission of foreign-built vessels other than pleasure craft for use on rivers and lakes (excluding, of course, all ships except those of German registry as the recipients of a subsidy); preferential railway rates on the transportation of shipbuilding materials; and a reduction in rates on export shipments. Direct aid was afforded by granting postal subventions as early as 1886, and as a result of these subventions, German ships were able to compete with the ships of other countries on routes to remote points. Under the Construction Bounty Act of 1921, an agreement was entered into between the shipowners and the German Government whereby the shipowners were to build or buy within ten years a sufficient amount of tonnage to approximate one-third of the tonnage lost as a result of the war. Approximately ninety per cent of this tonnage was to be constructed in German yards and if the amount of money available was sufficient, additional ships were then to be constructed. As a result of this, German shipyards were working to capacity as of June, 1923. In addition to this construction program a succeeding decree allowed the shipowners in business prior to June 17, 1921, to repurchase as many of their ships which had been seized or captured during the war as their finances permitted. This was later limited to a specific tonnage so as not to affect the domestic shipbuilding industry.

Austria-Hungary

The section devoted to Austria-Hungary naturally recounts its history prior to the World War. Indirect aid was afforded shipping by reserving the coastwise trade of Austria-Hungary to ships flying the flag of that empire; exemption from import duties of all materials used for the construction, repair, and alteration of vessels; registration of foreign-constructed vessels; exemption of income and trade taxes; reimbursement of Suez Canal dues; and, in the case of Austria, loans by the Austrian Government for the construction of new ships. The chapter then divides the subject into two headings: "Direct Aid Afforded by the Austrian Government" and "Direct Aid Afforded by the Hungarian Government." The first direct state aid in the form of shipping bounties or subsidies instituted by Austria occurred in 1893 which provided for four distinct benefits to shipping; namely trade bounties, navigation bounties, depreciation bounties, and exemption from trade and income taxes.

The first direct aid in the form of bounties extended to shipping under the Hungarian flag occurred in 1893 when a law was passed which provided for two kinds of bounties; namely, purchase bounties and mileage bounties. Both countries granted postal subventions over certain trade routes.

SPAIN

Spain, always a maritime nation, and at one time predominant in colonial possessions, has from the beginning subsidized shipping. Up to the Spanish-American War, subsidies were afforded various steamship companies for maintaining communication with its colonial possessions. With the loss of their possessions, Spain still continued its colonial subsidy program with the idea of maintaining regular lines of communication under the Spanish flag between those of the same race. The Spanish Subsidy and Navigation Act of 1909 was a plain expression of that purpose. Under it was consolidated the policy of maintaining communication over routes which Spain had followed since 1861, by subsidized steamship lines, and the policy of shipbuilding and navigation bounties adopted by Spain in 1889. These subsidies, which were allowed to lapse during the war period on account of the large profits accruing to the shipping companies, were revived by Royal Decree in 1922. The shipbuilding bounties were provided in order to stimulate domestic shipbuilding. In 1921, foreign-built ships were allowed for a period of six months to be imported into Spain for Spanish registry free of customs duties and registry fees. At the expiration of this period the rates of duty on foreign-built ships brought under Spanish register were considerably increased. In addition, in 1922, a bonus was authorized for the carrying of Spanish coal.

PORTUGAL

In 1922, a law was enacted for the purpose of encouraging Portugese shipping. The law provided for a reduction of 10 per cent in the custom duties and charges on cargo imported in Portugese ships; a reduction at 10 per cent in the export charges on cargo exported in Portugese ships to Portugese colonies; and a reduction of 20 per cent in export charges on merchandise exported to foreign countries in addition to other provisions of a high discriminating character.

GREECE

The Boer War and the enactment of a mortgage law in 1910, which enabled shipowners to borrow capital on favorable terms, were the underlying influences in the development of the Greek merchant marine. The coastwise trade of Greece is reserved to vessels of Greek registry, or to ships of nations that admit Greek vessels to their coasting trade. No direct subsidies are paid, mail being carried at the International Postal Union rates with but few exceptions.

LATIN AMERICAN COUNTRIES

Argentina

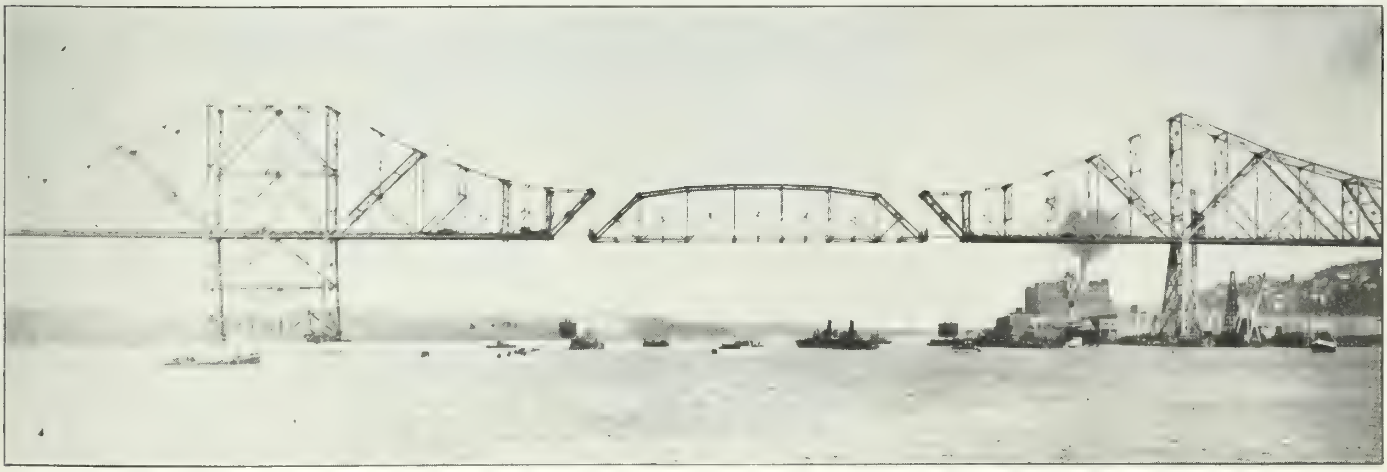
The Argentine merchant marine is unimportant except for the coasting trade. The coastwise mails are transported free in return for exemption of the mail steamers from registry fees, annual license fees, and various local charges, while the foreign mails are carried under the International Postal Union rates. No bounties or subsidies have yet been granted by the Argentine Government.

Chile

The Chilean merchant marine is very small although it has developed considerably in recent years. The government has extended direct mail subsidies to both Chilean and foreign shipping. In the case of the Pacific Steam Navigation Company an agreement has been entered into by which the company will carry mail free of charge, giving rebates in passenger fares to members of the Chilean Army, Navy, or Civil Service, as well as on the fares which the government pays for immigrants or colonists, in exchange for services such as the prompt dispatch of its ships, the use of the government's dry docks, preference in the use of cranes, etc. Chile has a law which reserves the coastwise trade of the country to ships under Chilean registry.

Brazil

The merchant marine of Brazil is the largest of all South American countries. Its development is due for the most part to the liberal subsidies granted by both the government and individual States, as well as the Government's operation of a merchant marine. The coastwise trade of the country is reserved to ships of Brazilian registry. Besides the regular subsidies offered for the operation of vessels in specific trade routes, a law has been enacted which provides bounties for shipbuilding. The foreign mails of Brazil are carried at the International Postal rates.



On March 19, 1927, the American Bridge Company successfully raised the last connecting truss of Carquinez Straits Bridge over San Francisco Bay. Weight of truss, 700 tons; weight of four sand box counterweights, about 800 tons; cables, 2½-inch American Steel and Wire; span length, 1100 feet; truss length, 440 feet. "Simple as raising a window sash," says the engineers. "Some sash!" says the layman.

Handling Cylindrical Loads

IT HAS always been a problem to handle cylindrical loads such as drums, barrels, reels, rolls of paper, bales, etc. If a crane is used the drum can be moved from one position and set down again, but without turning it over unless it is handled twice. If man power is used the work is slow and dangerous.

With the advent of the Elwell-Parker Electric Company's new roll handler the problem has been simplified and the time cut with all personal danger to workmen eliminated. The success of the roll handler, which has so generally been accepted by American and Canadian paper mills, proves the practicability of a mobile electric machine for this work.

The machine is one of a long list of special tools developed for American industries that come under the classification of electrical industrial trucks. The elevating and revolving scoop or apron along with the tilting uprights gives this tool advantages over all other machines built for similar work.

The apron for carrying the load is chain driven by a motor bolted to the uprights, and is raised on a carriage with four rollers running over machine ways which is lifted by a steel cable on a drum unit with motor enclosed. This motor also turns the drum to tilt the uprights.

When a load is being picked up either from a horizontal or vertical position the apron is tilted forward to the right angle so that the tapered edge is able to enter between the floor and the load; so that when the operator drives the machine forward the roll backed by the next roll or wall is raised by the wedging action and rolls or slides into the apron. The operator tilts the uprights back and the drum or roll lies in a secure rest while it is being transported.

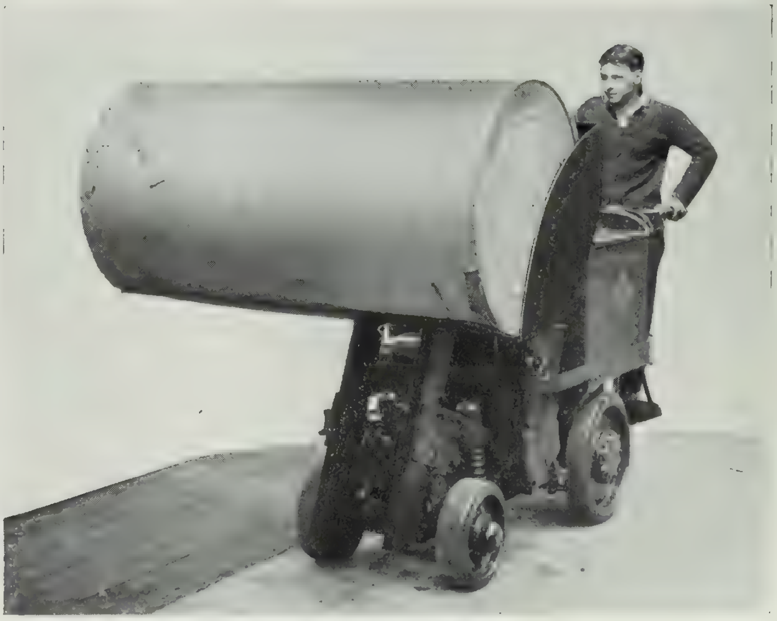
Some users have employed a rod or hook to catch the edge of a drum or to insert in the core hole of a roll to enable the operator to assist in tilting the roll back, but after the operator becomes more skillful in handling the machine this is found to be unnecessary and is usually discarded. Before the introduction of the roll handler upending a 72-inch roll in the paper industry required from five to seven men. The foreman of the gang usually inserted a pole in the center of the roll and one or two men lifted the roll high enough for a second pole to be placed under the roll, then with two men on each end and with a mighty effort the roll was set on end. Of course this operation took experienced men who worked together as one; but there was the ever present danger of the load sliding to one side and throwing all the load on three or four men with the chances of some one getting hurt.

If short rolls or barrels are to be handled, the machine will take two at one time and place them in storage or in cars, standing on end two high merely by rotating them to a vertical position. The tructor is then capable of tiering one more on top of the two if they are not over four feet in height.

The saving in man power in any industry should be at least a 4 to 1 ratio, for the machine runs at three times a walking speed, while the picking up operation will show a far greater saving. The economy in space will also be a credit to the user.

The cost of power maintenance and the dependableness is perhaps the most important characteristic of any machine outside of its ability to do the work for which it was purchased. It is not necessary to say anything concerning the continuous service afforded by all electric driven machines, when the power is thrown on the motor starts and runs continuously with no fagging until the whistle blows with the maximum torque exerted at low speeds and on steep grades.

The storage batteries are charged at night at an expense of 30 to 50 cents per charge for the power to do the next day's work, while drop forged and cast steel parts, such as gears, brake drums, housing crosses, and clutched plates made of alloy steel, assure low maintenance cost. With the electric trucking system there are advantages that are seen only by a user, the aisles are kept clear adding to the appearance of any shop or warehouse, and moral effect on the men of the continuous speed in handling materials must be counted in as a valuable return on the investment.

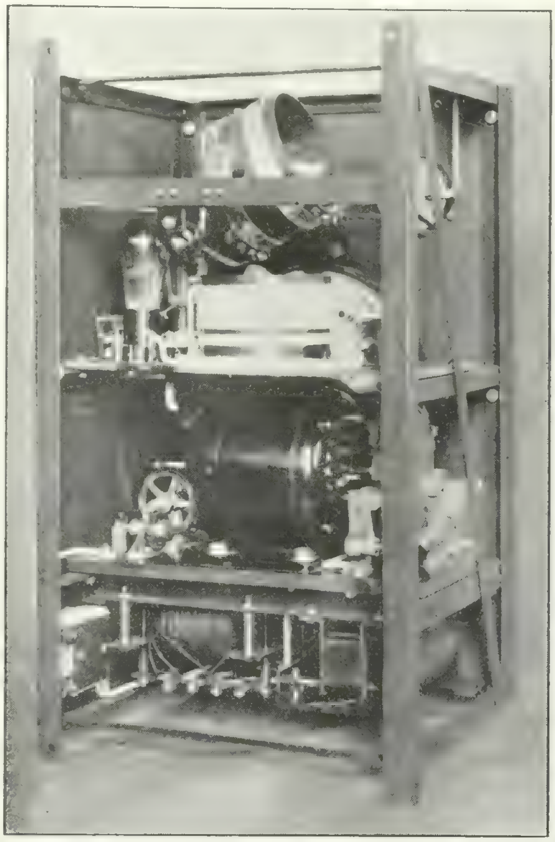

Elwell Parker Roll Handling Truck

ERIE PROPELLER SHAFTS

The Shipping Board has authorized the acceptance of a bid of the Erie Forge Company, of Erie, Pa., for furnishing propeller shafts for two vessels included in the Board's diesel conversion program. The vessels in question were the Seminole and the Wilscox. The successful bidder will furnish these requirements for $19,558, delivery to be made within 60 days for the first set and within 120 days for the second set.

The New Ship Radio Beacon

THE new Kolster mobile radio beacon has made its appearance on the Pacific installed on board the tanker J. C. Fitzsimmons of the Standard Oil Company. Developed by engineers of the Federal Telegraph Company, the Kolster radio beacon is a device for use on board ship as an aid in preventing collisions in fog. It represents the latest application of radio as an aid to navigation. When used in conjunction with the Kolster radio compass a new means is provided for one ship to take a bearing on another in a fog when within a ten or twelve mile zone of each other.



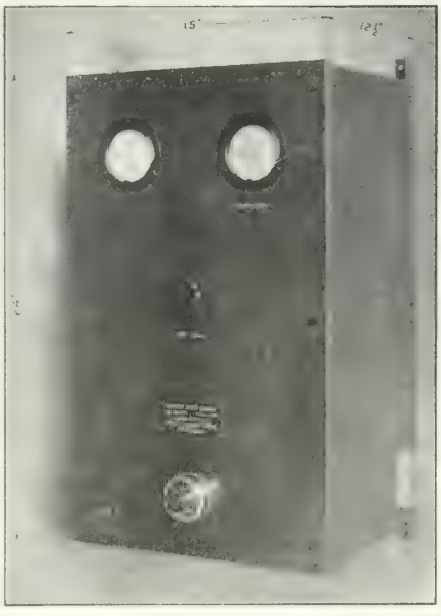
Rear view of Kolster automatic mobile radio beacon.

Being forwarned of the presence of another vessel, inside what may be termed the danger zone, perhaps dead ahead or crossing, bridge officers can be on the lookout for the whistle as the ships come closer together. Even at close quarters, there is an opportunity to make excellent use of the new ship radio beacon, there being no danger of false echo in fog as there is in the case of the whistle.

This new safety device is such a simple and inexpensive affair and adds so much to the protection of life and property that it ought to be installed on every ship afloat.

The ship radio beacon is an outgrowth of the shore radio beacon idea which was instigated by Dr. Kolster and developed and made a practical every-day aid by the U. S. Bureau of Lighthouses. Every navigator is or should be familiar with radio compasses and shore radio beacons. The use of the radio compass on board ship in the personal hands of the navigating officer is a far more certain method of obtaining a ship's position than asking a shore compass station to give it. There is no waiting in turn while the shore station takes bearings on other vessels, as hundreds of ships could all take bearings on one lighthouse radio beacon at the same time.

The entire unit composing the Kolster radio beacon is only 24 inches high, 15 inches wide, and 12½ inches deep. It is preferably mounted on a bulkhead or can be placed upon a table. The front panel contains a snap switch for starting the beacon, a power control knob, and two meters, one for radiation and one for filament current. The power control knob is set and left in position where the filament current reads 2.5 amperes. A ship's voltage may be anything from 80 to 120. By means of the power control knob, the filament current may be set at the correct value, 2.5 amperes, for any voltage within this wide range. This makes the beacon singularly adaptable to all types of ships. Once set, the power control is not again disturbed. It is then only necessary to turn on the snap switch to start the beacon operating.



Front view of Kolster automatic mobile radio beacon, showing compact dimensions.

The transmitter behind the panel is comprised of two 7½-watt vacuum tubes connected in parallel for safety and long life. An antenna coupler, which locks in place, connects the antennae electrically to the rest of the circuit. All connections are locked so that the beacon cannot oscillate on any wave length except 850 meters. This does away with all chances of causing interference to other channels such as the navy compass stations on 800 meters.

A motor serves to drive the power interrupter or chopper wheel and the automatic signalling mechanism. A system of special transformers and condensers is so arranged and connected with the chopper wheel that power is taken direct from the ship's mains without the use of any intermediary motor generator set as is required in most radio transmitters.

Intermittent continuous waves, or I.C.W., are transmitted, and the signal characteristic which has been adopted pending legislation on the subject consists of a series of one second dashes for thirty seconds followed by a silent period of thirty seconds. This continues automatically as long as the beacon is left turned on.

The signal characteristic is controlled by a small disc about two inches in diameter and can be easily changed in a few moments time, in case future regulations adopt some other signal as the standard for mobile radio beacons.

A small single wire aerial is used in connection with the ship radio beacon from 50 to 100 feet in length depending upon the conditions found on board ship. A ground connection to the ship's hull is employed in the usual manner.

It has been found that a radiation of approximately ½ ampere from

(Continued on Page 14, Advertising Section.)

Diesel-Electric Dredge Clackamas

Complete Operation and Maintenance Data Compared With Steam Dredges

By James H. Polhemus, General Manager and Chief Engineer, The Port of Portland

IN THE early part of the year 1925 The Port of Portland launched a 30-inch hydraulic diesel electric dredge called the Clackamas, which was placed in commission in the latter part of August of that year and has been in continuous operation ever since. This dredge was designed by The Port of Portland for special work to be done where the pipe lines would be long, and without the aid of a booster this dredge has successfully pumped through pipe lines 8600 feet in length against a net terminal lift of 30 feet for short periods.

The electrical equipment was furnished by the Westinghouse Electric & Manufacturing Company and the application of direct current to dredging purposes has been most satisfactory. The total power rating of the four main diesel engine generating units on the Clackamas is 3400 shaft horsepower and these generate 2300 kilowatts direct current at 500 volts. The operation of the electrical equipment has been surprisingly simple and economical. We have had no major repairs or replacements to make and practically all the maintenance work has been accomplished by the regular operating crew.

The four main diesel engines total 3400 shaft horsepower and were built by the McIntosh & Seymour Corporation of Auburn, N.Y., and have also proved very satisfactory. We have experienced no trouble whatever with diesel engine misalignment or engine vibration. The only major repair necessary on these engines was the replacement of a crank shaft which was defective, and we have experienced no trouble in operating all four engines continuously night and day throughout the week under full load conditions.

The diesel engines are of the air blast fuel injection type and are successfully burning what is known in this district as ordinary boiler fuel oil. The gravity of this fuel naturally varies but is what is furnished by the Standard Oil Company (Calif.) as their commercial fuel oil for burning under steam boilers. We have also burned what is known as commercial diesel oil, gravity about 24 degrees Baume, with excellent results. The air compressors for the high pressure injection air operate continuously with the engines, and with occasional regrinding of valves perform in a most satisfactory manner.

Sunday is used as dredge repair day, at which time the engine maintenance is also taken care of. This work consists of the usual changing of exhaust, fuel, and intake valves, taking up the slight bearing wear, and cleaning lubricating systems. The exhaust valves on the main engines are changed every three months and the intake valves every six months. This condition held true whether we were burning either boiler fuel oil or diesel oil. Pistons are also removed every six months, which reduces cylinder wear and possible scored liners or pistons by the accumulation of carbon behind rings and on piston tops. Cylinder wear averages about 1½ thousandths per month. The wear on the main bearings and crank pin bearings has been very slight, as shown by table "G." The wear on the piston pin bearings has been more severe and it is now estimated that after two years' operation these bearings will have to be rebabbitted due more to the cracking of the babbitt than the actual wear. This is a small and simple job and will be done by the regular dredge crew.

Calol diesel oil manufactured by the Standard Oil Company (Calif.) has been used in the lubrication of the engines. The kilowatt output per gallon of cylinder oil has averaged for the year 2617.

Both Sharples and De Laval mechanical separators have been used with success to clean the fuel oil before burning and to purify the used lubricating oil.

The Port of Portland's cost and operating records are kept on a fiscal year basis, ending November 30 of each year; therefore we shall analyse the record of the dredge Clackamas for the last fiscal year, ending November 30, 1926. In Table "A" we give a synopsis of the working time and yardage output of this dredge since going into commission. In Table "B" is shown a comparison of the work done by three of the Port's 30-inch hydraulic pipe line steam dredges of different power ratings operated during the fiscal year 1926.

The 30-inch steam dredge Columbia, shown in this table, has a 1200 shaft horsepower four triple expansion engine for driving the dredging pump. The 30-inch steam dredge Tualatin's pump is driven through reduction gears by twin turbines of 2000 shaft horsepower; while the Clackamas has a 2700 horsepower motor driving the dredging pump. The cost figures are based on burning fuel oil at $1.30 a barrel on the steam dredges, although as a matter of fact we burned a cheaper fuel, commonly known in this district as "hog fuel." This is sawdust and chopped saw mill waste, a by-product of the numerous large lumber mills located in the city of Portland and vicinity. It will be noted in this statement that the dredge Clackamas had a much longer pipe line and did cheaper dredging.

Although the Clackamas is the most powerful and largest dredge in our fleet, it is the cheapest to operate due to the economies of the diesel engines. The dredge, due to its power, simplicity, and the flexibility of design, did the cheapest as well as the most difficult dredging of any of the dredges. The material handled in most cases was a heavy sharp sand, but some gravel and clay were encountered. For all practical purposes the dredges shown in Table "B" were called upon to

TABLE "A"

Work Done By the Dredge "Clackamas" Since Going Into Commission

Month	Cubic Yds.	Net Terminal Lift	Length of Pipe Line	Pumping Hours	Operating days
1925					
September	413,230	29.1	6,273	433	25
October	855,540	29.7	4,967	495	26
November	426,075	31.	5,619	488	24
December	448,820	28.6	4,887	569	26
1926					
January	615,990	28.9	4,564	546	26
February	467,800	25.1	6,601	448	24
March	504,350	29.3	5,988	573	27
April	337,580	28.5	7,085	554	26
May	394,260	24.5	6,288	503	25
June	152,500	27.6	3,904	150	8
July	755,320	29.9	3,923	510	26
August	1,027,250	31.8	2,601	522	27
September	548,440	31.6	4,229	499	25
October	659,990	30.5	3,585	528	26
November	364,835	28.	4,114	483	24

TABLE "B"

Comparative Dredging Record for the Fiscal Year Ending November 30, 1926, for Two Steam Dredges and the Diesel Electric Dredge "Clackamas"

Name of Dredge	Rated Pump Shaft H. P.	Cubic Yards Dredged	Net Terminal Lift	Length of Pipe Line	Transport Units	Total Pumping Hours	Total Cost of Operation	Cost per Cubic Yard	Cost per Trs. Unit	Cost per Pump H. P. Year
Columbia	1200	3,645,635	27.4	3,765	165,209	4,127	216,810.66	.0594	1.31	180.68
Tualatin	2000	2,818,900	25.6	3,973	131,024	5,405	221,784.43	.0787	1.69	110.89
Clackamas	2700	6,277,135	28.9	4,808	380,385	5,932	206,799.00	.0329	0.54	76.00

The term "transport unit" is used to designate a unit used as a basis of comparison. A transport unit is 1000 cubic yards pumped through 100 feet of pipe line. One foot of net terminal lift is equivalent to 50 feet of 30 inch pipe line. By transposing all dredge output to transport units, we equalize, for purposes of comparing costs, the variation in pumping head between short and long pipe line dredging.

do the same class of work during the year, but the length of pipe line varied, the lower powered dredges being confined to the shorter pipe line. Dredges of similar type, operating in the same class of material and pumping through pipe lines not exceeding the length for which they were designed, the output will be greater for the higher powered dredges within certain limits. Long pipe lines increase the pumping head and require more power at the pump. Very heavy materials require greater pump power even for the relatively short pipe lines. The Clackamas has demonstated that it can do very successful work in heavy material on long pipe lines where similar sized dredges of less power could not be operated with any results whatever.

The costs shown do not include overhead, depreciation, or interest charges and are given for comparative purposes as between our dredges only and do not include the cost of shore work. If we were figuring costs for doing contract work, the totals would have to be at least doubled and possibly trebled, depending upon the volume of steady work done over which the more or less fixed upkeep costs could be spread. A successful contractor must also set aside a considerable sum on each contract to protect him against contingencies and losses which he is bound to encounter.

In Table "C" we give a direct comparison between the dredges Tualatin and Clackamas on long pipe line work pumping pea gravel. Three average days were taken for each dredge working under identical operating conditions.

In Table "D" a detailed comparison of dredge operating and maintenance cost and performance for The Port of Portland dredges was made which is of interest and is set forth in full. This table shows costs under logical groupings in totals and percentages, with a separate total for the cost of operating electric booster pumps with steam dredges; also the number of days, output, length of pipe line, and power rating. Table "E" shows the same costs apportioned on an "operating day" and "cubic yard" basis for each group. These tables show that the operating costs of a dredge are about two-thirds, while the maintenance costs are one-third of the total. This relation also holds true for all four dredges shown, irrespective of variation in power or types of dredges.

The superiority of the dredge Clackamas is not due alone to the economy of the diesel engines, but to its excess power, extreme flexibility due to application of electrical power, efficient dredge pump, and ability to put in more uninterrupted pumping time. By employing this dredge on the long pipe line work, which it handles without requiring the use of electric booster pumps as used with lower powered dredges, it effects a large yearly saving to the Port. The long pipe line work cuts down the output of the dredge over what it would have been if the pipe line had been shorter.

Our experience with the dredge Clackamas, where we have an adjustable speed and variable horsepower pump motor, indicates there is a limiting economic pump power required for each dredging condition which is determined by both the length of pipe line and the character of material dredged. This is constantly being proved by applying different powers to the dredge pump and measuring the resulting pipe line velocities and yardage moved. We have noted conditions where it required 350 additional horsepower to be applied to the dredge pump to get five more revolutions per

TABLE "C"

Dredge "Clackamas"

Date	Cubic Yards Dredged	Pipe Line Vac.	Pipe Line Press.	Net Term. Lift In Ft.	Length of Pipe Line	Diam. of Pump Impeller	Pump R. P. M.
Nov. 9	12,320	15	80	30	5,960	70 Inch	321
" 10	15,400	14	83	30	5,960	70 "	326
" 12	9,240	15	80	30	4,830	70 "	320

Sub-Total 36,960 Cost at $715.00 per day — $2,145. Cost per cu. yd. $0.058.

Dredge "Tualatin"

Jan. 1	9,000	11	56	30	5,785	69 Inch	290
" 2	8,800	12	58	30	5,745	69 "	290
" 3	8,500	11	58	30	5,745	69 "	290

Sub-Total 26,300 Cost at $657.00 per day $1,971. Cost per cu. yd. $0.075

Using oil fuel in place of logged wood the "Tualatin's" cost per cubic yard would be $0.095 on the basis of 27 per cent increase in total operating cost.

TABLE "D"

THE PORT OF PORTLAND DREDGES

Recapitulated Summary of Operating and Maintenance Costs

Total Expenditures

ITEMS	DREDGE WILLAMETTE		DREDGE COLUMBIA		DREDGE TUALATIN		DREDGE CLACKAMAS	
For Period	Jan. 1, 1922 - July 31, 1926	% of Total	Jan. 1, 1922 - July 31, 1926	% of Total	Jan. 1, 1922 - July 31, 1926	% of Total	Aug. 17,1925 - July 31, 1926	% of Total
OPERATION.								
Labor (Operating)	$190,003.87	.290	$197,739.22	.286	$204,021.23	.257	$ 50,732.44	.259
Fuel & Water	67,712.64	.103	84.200.29	.122	130,061.48	.164	30.678.71	.157
Engineer Dept. Supplies	14,471.59	.022	14,792.15	.021	9,446.23	.012	14 408.25	.074
Deck & Miscellaneous Supplies	10,592.98	.016	13.107.64	.019	10,215.14	.013	2,933.50	.015
Auxiliary Operation	63,516.51	.097	63,893.29	.092	87,150.33	.110	7.927.80	.040
Subsistence	44,422.03	.068	46,321.73	.067	47,000.50	.059	10.900.22	.056
Insurance	37,685.51	.057	57.549.60	.083	44,096.82	.056	14.100.01	.072
Sub-Total (Operation)	428,405.13	.653	477,603.92	.690	531,991.73	.670	131,660.93	.672
MAINTENANCE.								
Cutting Machinery	31,884.64	.049	46,503.61	.067	21,824.44	.027	1,776.08	.009
Hull Pipe & Fittings	17,602.35	.027	11,957.96	.017	20,684.19	.026	927.41	.005
Ground Tackle	20,353.86	.031	20,237.49	.029	17,382.03	.022	2,195.35	.011
Dredging Pump	50,749.16	.077	65,774.83	.095	69,425.51	.087	24,117.84	.123
Power Plant & Auxiliaries	54,959.43	.084	36,363.80	.053	79,343.08	.100	26,239.99	.133
Miscellaneous Dredging Plant	21,010.39	.034	16,505.20	.024	24,016.90	.030	3,660.28	.019
Hull & House	23,734.06	.036	13,708.46	.020	21,825.87	.027	3,863.45	.020
Miscellaneous Supplies & Labor	4,355.83	.007	1,372.04	.002	4,934.41	.006	954.06	.005
Insurance	2,797.83	.004	1,442.14	.002	2,928.88	.004	566.02	.003
Sub-Total (Maintenance)	227,447.55	.347	213,865.53	.309	262,365.31	.330	64,300.48	.328
Total Operation & Maintenance	655,852.68	100%	691,469.45	100%	794,357.04	100%	195,981.41	100%
Booster Operation	9,813.32		65,296.90		62,026.36			
Total All Items	$665,666.00		$756,766.35		$856,383.40		$195,981.41	
PERFORMANCE:								
No. of Operating Days	1,228		1,229		1,208		274	
Total Cubic Yards Dredged	12,387,075		15,336,954		19,962,478		5,564,945	
No. Cubic Yards With Booster	322,340		3,695,820		1,560,545			
Cubic Yards per Operating Day	10,087		12,500		14,042		20,310	
Average Length of Pipe Line	2,635		3,147		3,794		5,445	
Rated Pump S.H.P.	1,200		1,200		2,000		2,700	

TABLE "E"

THE PORT OF PORTLAND DREDGES

Recapitulated Summary of Operating & Maintenance Costs Showing Unit Costs

	30-inch Steam DREDGE WILLAMETTE		30-inch Steam DREDGE COLUMBIA		30-inch Steam DREDGE TUALATIN		30-inch Diesel Electric DREDGE CLACKAMAS	
OPERATION.	Per. Oper. Day	Per Cu. Yard	Per. Oper. Day	Per Cu. Yard	Per. Oper. Day	Per Cu. Yard	Per. Oper. Day	Per Cu. Yard
Labor (Operating)	$154.73	.01534	$161.16	.01289	$168.89	.01022	$185.15	.00912
Fuel & Water	55.14	.00547	68.62	.00549	107.67	.00652	111.97	.00551
Engineer. Dept Supplies	11.78	.00117	12.06	.00096	7.82	.00047	52.58	.00259
Dock and Miscellaneous Supplies	8.63	.00086	10.68	.00085	8.45	.00051	10.71	.00053
Auxiliary Operation	51.72	.00513	52.07	.00417	72.14	.00437	28.93	.00142
Subsistence	36.17	.00359	37.75	.00302	38.91	.00235	39.78	.00196
Insurance	30.69	.00304	46.90	.00375	36.50	.00221	51.46	.00253
Sub-Total (Operation)	348.86	.03458	389.25	.03114	440.39	.02665	480.59	.02366
MAINTENANCE.								
Cutting Machinery	25.96	.00257	37.90	.00303	18.07	.00109	6.48	.00032
Hull Pipe & Fittings	14.33	.00142	9.75	.00078	17.12	.00103	3.38	.00017
Ground Tackle	16.57	.00164	16.49	.00132	14.39	.00087	8.01	.00039
Dredging Pump	41.32	.00409	53.61	.00429	57.47	.00348	88.02	.00433
Power Plant & Auxiliaries	44.76	.00444	29.64	.00237	65.68	.00397	95.77	.00472
Miscel. Dredging Plant	17.11	.00169	13.45	.00107	19.88	.00120	13.36	.00066
Hull & House	19.33	.00192	11.17	.00089	18.07	.00109	14.10	.00069
Miscel. Supplies & Labor	3.55	.00035	1.12	.00009	4.08	.00025	3.48	.00017
Insurance	2.28	.00023	1.18	.00009	2.42	.00015	2.07	.00010
Sub-total (Maintenance)	185.21	.01836	174.30	.01394	217.19	.01314	234.67	.01155
Total Operation & Maintenance	534.07	.05294	563.55	.04508	657.58	.03979	715.26	.03521
Booster Operation		.03044		.01766		.03975		
Total All Items		.05374		.04934		.04290		.03521

minute, with no resulting benefits. In this case the pressure and vacuum hardly changed and no greater yardage was dredged.

On short pipe lines in sand we have found that with three out of the four main engines operating we get all the power we need to secure maximum yardage, and in the same location with the same length of pipe line but pumping pea gravel, we need the power of all four engines. The pipe line pressure goes up and the output goes down, all being due to the class of material dredged.

By experience, the operators of the Clackamas pick out the proper and most economical dredging power to meet each operating condition, which we find to vary for the various jobs which the dredge is called upon to do. This extreme flexibility is most readily obtained by electric drive, which we feel justifies the additional first cost in large high powered dredges. The over-all efficiency of the diesel-electric dredge has been found to be high, due to its ability to exchange power automatically between the main pump unit and the cutting units, as well as the other auxiliary motor

TABLE "F"

Work Done by the Dredge "Clackamas" Since Going Into Commission

Date	Cubic Yards Dredged	Net Term. Lift Ft.	Length of Pipe Line Ft.	Input Into Main Pump Kw. Hr.	Pumping Hours	Input Into Balancer Set	Operating Days	Total K.W. Hrs. to Include the Main Pump Balancer Set and Service Motors	Cubic Yards Per K.W. Hrs.	K.W. Hrs. per Cubic Yard	Percent of All Aux. Power to Total Power Balancer Set and Service Motors	Material
1925												
Sept.	413,230	29.1	6,273		433	Cutter Motor	25	809,381	.51	1.96	Percent of all power used for all purposes on dredge except main pump motor to total power generated	Sand
Oct.	855,540	29.7	4,967		495	Swing. Winch	26	1,081,090	.79	1.26		"
Nov.	426,075	31.0	5,619		488	Lighting	24	1,034,790	.41	2.43		"
Dec.	448,820	28.6	4,887		539	Cooking	26	885,910	.50	2.00		"
Sub total	2,143,665							3,821,171				
1926												
Jany.	615,990	28.9	4,564	810,100	546	32,945	26	874,920	.70	1.42	7.41	"
Feby.	467,800	25.1	6,601	914,100	448	36,123	24	961,480	.49	2.06	4.93	"
March	504,350	29.3	5,988	1,070,600	573	41,789	27	1,131,860	.45	2.24	5.41	"
April	337,580	28.5	7,085	1,030,500	554	37,255	26	1,095,540	.31	3.24	5.94	"
May	394,260	24.5	6,288	928,050	503	39,290	25	975,350	.40	2.47	4.85	"
June	152,500	27.6	3,904	249,982	150	12,782	8	262,980	.58	1.72	4.95	"
July	755,320	29.9	3,923	916,192	510	64,744	26	993,150	.76	1.31	7.75	"
August	1,027,250	31.8	2,601	952,486	522	59,417	27	1,012,060	1.02	.99	5.89	"
Sept.	548,440	31.6	4,229	881,854	499	62,845	25	946,490	.58	1.73	6.83	"
Oct.	659,990	30.5	3,585	939,897	528	59,688	26	1,000,060	.66	1.52	6.02	"
Nov.	364,835	28.	4,114	944,893	483	55,816	24	1,001,560	.36	2.75	5.66	"
Sub-Total	5,828,315							10,255,460				
Total	7,971,980							14,076,631				

7,971,980 ÷ 14,076,631 = 0.566 cubic yards per K.W.H. 14,076,631 ÷ 7,971,980 = 1.766 K.W.H. per cubic yard. Average pipe line about 5,500 feet. 16 ft. lift.

Power for the several service motors is taken off the three wire system at 250 volts, hence this power makes up for the discrepancy between the Balancer Set plus the main pump motor and the total power generated.

TABLE "G"

Showing the measured bearing wear on the four main diesel engines of the dredge "Clackamas" for the fiscal year 1926. During this period the dredge got in 5932 actual pumping hours.

Engines Nos. 1 and 2 have six cylinders with oil cooled trunk type pistons 22 inches in diameter, developing 900 B. H. P. each at 150 R. P.M. They were reconverted Shipping Board engines.

Engines Nos. 3 and 4 have eight cylinders with dry or uncooled trunk type pistons 17 inches in diameter developing 800 B. H. P. each at 200 R. P. M.

Engine	No. 1	No. 2	No. 3	No. 4
Main Bearing	.006	.008	.005	.005
Crank Pin	.003	.0025	.001	.001
Piston Pin	.012	.008	.002	.002
Crank Pin	.006	.010	.006	.006
Piston Pin	.002	.003	.001	.002

driven machinery. The average electrical load used for all purposes other than driving the main dredging pump did not exceed 7 per cent for the Clackamas during the last fiscal year, although there were peak loads requiring as much as 25 per cent of the total load.

In Table "H" is shown the relative maintenance cost for the diesel-electric dredge Clackamas as compared with the like sized steam turbine and reciprocating engine powered dredges.

It is felt that anyone considering the building of a diesel dredge will want to know definitely what the upkeep problems and expense will be on the diesel engines as compared with steam equipment. It is perfectly evident that there will be a great saving in fuel for the diesel dredge. You will note this maintenance expense for the diesel dredge during its first year is only about half of that of the steam dredges. It was felt fair to compare the diesel engines directly with the boilers and main dredge pump engine or turbine, while all other things were considered equal on all three types of dredges. The steam dredge maintenance and repair expense was taken as a year's average cost on a five-year basis.

TABLE "H"

Comparative Power Plant, Maintenance Costs on 30-Inch Pipe Line Dredges

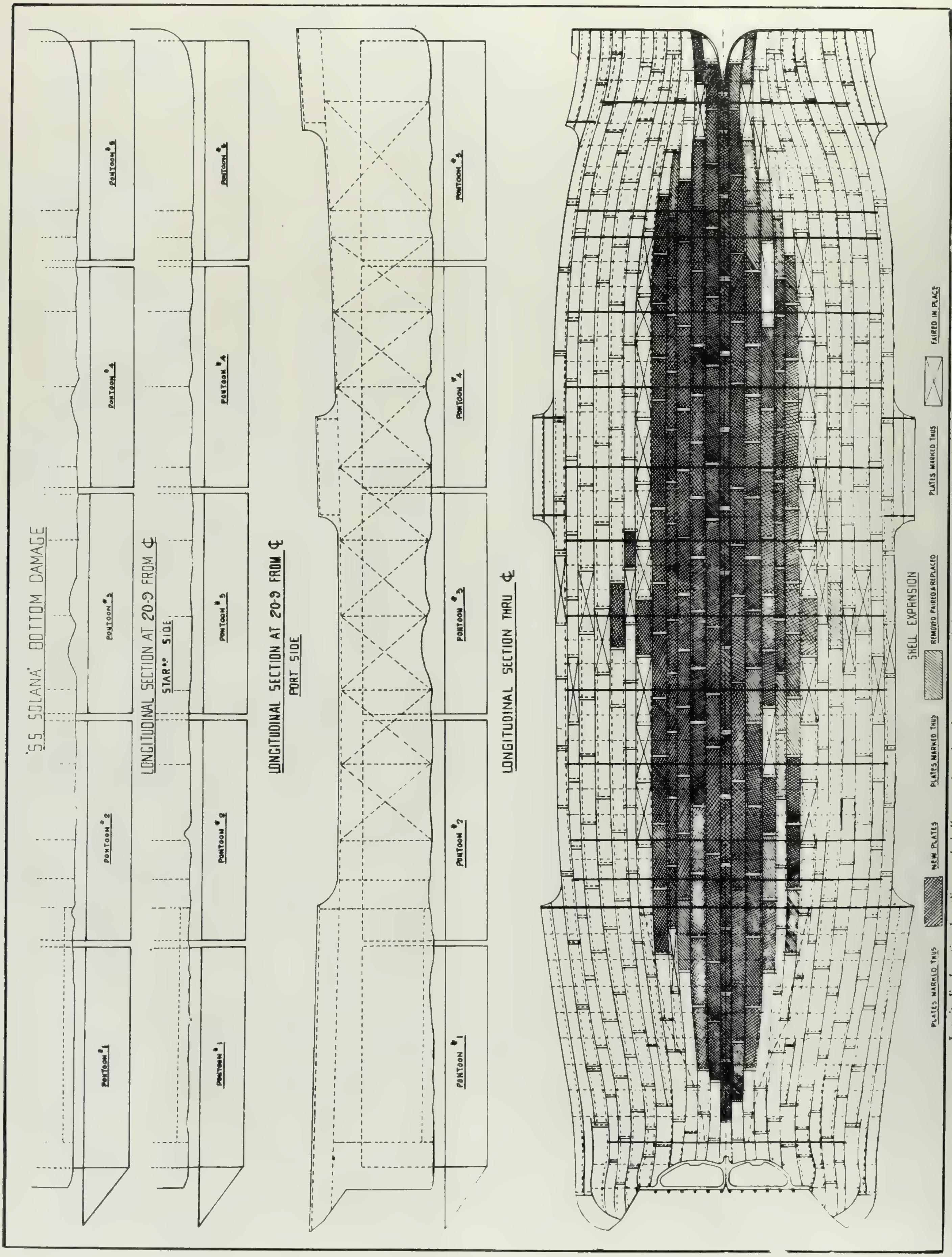
Diesel Electric (4 main diesel engines only) vs. Steam Reciprocating and Turbine Dredges (Boiler plant and main pump engine only). Based on actual average B. H. P. used by main dredge pump.

	Diesel Elect. Dredge Clackamas	Steam Geared Turbine Drg. Tualatin	4 Cylinder Triple Expansion	
			Dredge Columbia	Dredge Willamette
	3000 b.h.p. 1 year 1926	2000 b.h.p. 5 years 1922-1926	1200 b.h.p. 5 years 1922-1926	1200 b.h.p. 5 years 1922-1926
MAIN ENGINES:				
Current maintenance	$7,048.00	$ 1,637.00	$ 2,860.00	$ 3,299.00
Overhaul Repairs	1,880.00	10,379.00	8,894.00	7,632.00
Renewals	945.00	12,885.00		
Avg. 1 year	9,873.00	4,980.20	2,350.80	2,186.20
BOILERS:				
Current maintenance		3,911.00	1,993.00	3,981.00
Overhaul Repairs		18,301.00	5,757.00	10,265.00
Renewals		4,630.00	2,107.00	2,036.00
Avg. 1 year		5,368.40	1,971.40	3,256.40
FURNACES:				
Current maintenance		5,901.00	8,121.00	6,797.00
Overhaul Repairs		3,741.00	7,690.00	3,799.00
Renewals			145.00	
Avg. 1 year		1,928.40	3,191.20	2,119.20
Total	9,873.00	61,385.00	37,567.00	37,809.00
Avg. 1 year	9,873.00	*12,277.00	*7,513.40	*7,561.80
Cost per B.H.P.	$3.291	*6.1385	*6.261	*6.302
Total cost of Maint. for 1 yr. incl. drg. crew labor	9,873.00	13,277.00	8,513.40	8,561.80
Cost per B.H.P. incl. dredge crew labor	†3.29	6.64	7.09	7.13

* Work of dredge crew maintaining boiler plant and main pumping engine is not included. This amounts to about $1000.00 per year per dredge. This cost was included in the "Clackamas" costs on diesel engine maintenance.

†Over a period of 5 years this cost may be doubled due to renewal of cylinder liners and new pistons. Only time will tell what this expense actually will be.

Portland, Oregon. February 14, 1927.



Longitudinal sectional outlines and shell expansion plan showing extent of damage to bottom and bilges of Associated Oil Company's tanker Solana.

Bottom Repairs of Steamship Solana

By G. B. Newby, Naval Architect and Chief Engineer of the Los Angeles Shipbuilding and Drydock Corporation, San Pedro, California

SINCE the advent of the sectional type of floating drydock, controversy has arisen from time to time among shipping men as to the relative merits of a multiple unit floating dock, as compared with a graving dock or marine railway, for making bottom repairs of considerable magnitude.

It is not the purpose of this article to settle this question, but to give a brief history of the procedure followed in effecting one of the largest bottom repairs ever made on the Pacific Coast, which was carried out successfully on five units of a six-unit floating drydock.

View of bottom of Associated Oil Tanker Solana on dry-dock at Los Angeles Shipbuilding & Dry Dock Corp.

On November 3, 1926, the steamship Solana, owned by the Associated Oil Company of California, went broadside in a dense fog, on the sandy beach at Purisima Point, eight miles north of Point Arguello.

In less than twenty-four hours from time of grounding ½ of the full cargo of oil had been pumped overboard and the Solana was again floated.

The buckled side plating and the fact that the ladders to cargo tanks were warped and forced up through the hatches indicated that the vessel's bottom was badly distorted. The bottom, of course, could not be seen owing to a partial cargo of oil and sea water.

Under her own steam and with cargo pumps working to capacity the Solana made for the Associated Oil dock at San Pedro where on arrival she was immediately ordered dry-docked for survey at the yard of the Los Angeles Shipbuilding and Dry Dock Corporation.

The survey called for one hundred and twenty-four new shell plates and an additional forty-nine to be faired and returned or faired in place. The bottom strakes of the centerline and transverse bulkheads were buckled. No less than thirty-eight plates were ordered new or faired on the bulkheads. The web floors, web bilge brackets, and side girder in almost every tank, port and starboard, were turned and twisted. The floors and vertical centerline keel plates, in the double bottom under machinery space were out of line and had to be renewed. A total of one hundred new longitudinals with their brackets were specified to be new, and forty-five others faired. All cargo piping, valves, valve operating gears, and all ladders in cargo tanks were ordered renewed or overhauled to bring them back to their original conditions.

A reference to the illustration will give a clearer idea of the magnitude of the damage than the above description. The shell expansion is self-explanatory. On the profile, owing to the small scale, it was necessary to exaggerate the depth of indentations in order to show them clearly. It will be noted in the longitudinal section at centerline there was hardly one running foot of flat keel plate fair, from the second plate aft to the stem. The same is true in the longitudinal sections taken on the 20-foot 9-inch buttocks, port and starboard. In fact on the flat bottom scarcely one square foot of surface remained in its original plane.

After the survey was completed and while waiting for tenders, the Solana was again floated. After the preliminary survey some discussion arose as to the possibility of successfully carrying out bottom repairs of this magnitude in any way except on a graving dock or a marine railway. To substantiate this it was argued that alignment and fairness could not be maintained on a sectional dock, where the damage extended beyond one or more units of the dock. However, these contentions did not prevail.

After bids were opened and the Los Angeles Shipbuilding and Drydock Corporation proved to be the lowest bidder, the owners and underwriters were satisfied that a multiple unit dry-dock was no hindrance to a perfect repair of a major bottom job. They were further convinced that it would be easy to straighten a hogged or sagged vessel by manipulating the pontoons, and that there would be no difficulty in holding the vessel in her true alignment. These conclusions have since proved correct. The contract was awarded to the Los Angeles Shipbuilding and Drydock Corporation, and the Solana was again placed on drydock for repairs.

A. L. Becker, veteran shipbuilder of the Great Lakes and Pacific Coast, and marine surveyor, with offices in San Francisco, was placed in charge of the work as special representative of the owners.

Docking for Repair

When on dry-dock for survey, measurements were taken from which it was possible to build blocks to suit the distorted bottom of the ship. The keel blocks were raised 4 feet 6 inches to provide head room. Owing to the buckled condition of the centerline struc-

(Continued on Page 20, Advertising Section)

Oil Burning Hints

Notes on the Management of Marine Boilers

By George W. Wallace

SO MUCH has been said about fuel oil installation and so little concerning the routine necessary to develop the highest possible efficiency in the well known designs that the writer deems it essential to add a few hints so vital to fuel economy.

First, let us start with an installation unfamiliar to the engineer about to take charge of the plant. What then? To become familiar with it immediately after taking charge should be his foremost endeavor. The best way to accomplish a problem of so much importance toward efficient operation is to make one's self familiar with all the data furnished by the manufacturer of the installation in question. There is much valuable information contained within the covers of these pamphlets written by the manufacturers of the different units, which, if intelligently interpreted, will lead to a much better showing even in units now considered obsolete. Hence, it is imperative that the engineer take advantage of this information so cheerfully furnished by representatives in various ports, who are engineers themselves and ready to help solve any problem that might arise.

A subscription to one of the various engineering magazines, so well written and covering new discoveries so completely, is another step in the right direction. In them are contained many useful suggestions to the engineer. Here also he may find, through the advertising columns, information of much value. The editors of these magazines will gladly cooperate also, and all that is required to get in touch with them is a few cents postage.

Assuming now that we have a working knowledge of the plant, let us consider a few points essential to a successful voyage. Orders are given to get under way and fires are to be lighted. The usual procedure of bringing a boiler up to line pressure is known to every engineer, but the mistake of keeping all the boilers of the plant with one or two fires under them after they are warmed up instead of cutting them out when the sailing hour is ten or twelve hours distant and working one or two at full capacity is too much practiced and results in a pronounced waste of fuel. In other words, do not keep any more boilers on the line for auxiliary purposes than is absolutely needed. Keeping all the burners lighted under a boiler and operating at or near its rated capacity has a tendency to maintain excess air at a minimum. This is difficult to accomplish due to leakages past the closed shutters when only half the number of burners under a boiler are in operation.

Viscosometer

After deciding upon the number of boilers to be used, an analysis of the fuel oil should be obtained to determine the operating conditions best suited for the oil on hand. It can be here stated that the oil company furnishing the fuel can do a tremendous amount of good by including at least three viscosity readings at temperatures varying widely enough to enable the engineer to plot a curve that will readily show him the viscosity of each shipment of fuel at any desired temperature. The usual information that the oil is 100 Saybolt seconds at 150 degrees Fahrenheit, for example, is of little use to the engineer. Who can tell what viscosity it will be at 175 degrees Fahrenheit? Not many in the operating field, I assure you. It is deplorable indeed that the shipowners do not realize the value of the viscosometer. One placed aboard every steam vessel would pay for itself many times over in one voyage.

The above paragraph suggests the engineer's first step necessary toward fuel economy. The day of "I guess that is close enough" is gone. We must know facts to obtain results. The neglect of including a viscosometer in every boiler room equipment leaves the engineer to seek his viscosity readings from the oil company or rely on guess work, which is a poor alternative at best.

While the knowledge of the viscosity of the fuel to be burnt under a boiler is of prime importance, much more must be taken into consideration before a creditable showing can be made.

In the opinion of the writer (and it has been tried out successfully by other engineers), after a ship has been under way long enough for the fire rooms and brick work to come up to normal running conditions, the temperature of the oil can be reduced as much as twenty-five degrees below the viscosity required at "lighting off" when cold firerooms and brickwork are encountered without any loss in economy. This decrease in temperature is taken care of by the perfection of the present day atomizing elements after the boilers have come up to steady steaming condition.

Care of Tips

Another way to increase mechanical atomization is to use small tips with a fairly high pressure, say 150 to 200 pounds, which greatly aids in breaking up the oil in the burner; also the smaller tips aid in maintaining a higher pressure at a lower temperature. It should be noted that any reduction in oil temperature is a saving, as less steam is required to heat the oil and the oil pump does not have to deliver so much volume, therefore less strokes and less steam.

The question naturally will arise as to how far reduced temperature and increased pressure through use of smaller tips can be carried out. That will depend upon the quantity of oil necessary per burner per hour to keep the ship on schedule. The quantity that can be forced through a given size tip at a given temperature and pressure can be obtained from the maker of the burner. Another important point is the flame angle; strict attention should be paid to see that it does not strike the boiler walls or tubes. Then, there is the practice of cleaning a certain number of burners under each boiler per watch. This procedure is out of harmony with the writer's views, as very often many burners, on the larger ships especially, are taken out without accomplishing any gain. The number of burners to be cleaned every watch should be decided upon by the engineer, and only after a careful examination of their condition noted.

Gas Analysis

After the firerooms have come up to normal steaming conditions, an effort should be made to establish a set of instructions from day to day for the personnel to follow.

Much can be done along this line by aid of the Gas Analysis machine that has been put aboard ships of the Shipping Board at least and like the viscosometer should be part of the boiler room equipment of every steam vessel. The Gas Analysis machine is a valuable asset to every boiler room when care is exercised in making tests and judgment used in following the information obtained fro mits use. An explanation of a few tests on different days, for example, will demonstrate its usefulness. Watching carbon dioxide will demonstrate that the amount of air required for combustion can be very considerably reduced after the furnaces are heated up or after the ship is under way a few hours.

We shall deal only with the carbon dioxide test, as it is the most important of them all. Suppose on our first test we encounter little difficulty and all our tests show from 13 to 14 per cent carbon dioxide, which is considered very good. We have every reason to believe such gratifying tests show that our boiler casings are free from air leaks, our boilers are clean on the fireside at least, because our draft must be good to obtain such a result, each burner is clean and getting its proper amount of air and oil, and our air pressure and shutter openings correctly adjusted. This also indicates that baffles are tight. But tomorrow will be another day and who knows but what some changes of conditions may be brought about, forcing the engineer to alter the setting of the previous day. We make out test as before and with no noticeable change of conditions we find that our best efforts are 12 to 13 per cent carbon dioxide, not bad, but somewhat lower than the day previous. The usual speculation as to what may be the cause of it all comes up and is naturally followed by a process of elimination of probable causes. After an examination we find that everything looks normal as far as tight casings, clean burners, and shutters are concerned. But what about the fireroom temperatures, have they risen any? If so, should not the speed of the blower be increased to increase the volume made less by the higher fireroom temperature expanding the air by the time it reaches the burners? Then again, it may be that the bridge has called for a few more revolutions per minute, which means more air if more oil is required. How many note the barometer to see if a slight drop in atmospheric pressure has occurred, with a corresponding effect in the tests being made? Trouble may also come from the ventilators being turned away from the wind, and while the blowers show the same steam pressure they have to reach out for the air instead of it being blown into the vent, as is the case when properly trimmed.

It seems our designers could with much profit to the owner, pay a little more attention to the ventilators when designing the vessel, to insure a plentiful supply of air reaching the firerooms from any direction they might be turned. Too often a ventilator is rendered useless by being placed too near the stack, thus bringing it under the lee of the funnel on many routes for long intervals. Placing them behind the bridge is another bad example, but if this condition must exist, why not extend them high enough above the bridge to derive the benefit of the wind created by the ship's speed? All this leads to less steam for blower consumption, which is an important item, particularly on forced draft units.

A very common failure often occurring and going on undetected in many cases is the neglect to watch the temperature of the water used to handle the many gases being tested. It is not known to many engineers, or else they overlook the fact, that gases are more soluble in cold than in hot water. Hence, the colder the sides of the tubes can be made by the water as it washes the gases back and forth, the colder will become the gases, with a result that a better test will be obtained for a given number of times with cold water than with warm water at ordinary temperatures. Lastly, there is the consideration to be made of the number of days the ship has been under way. It would not be expected to turn in as good a test near the end of a voyage as at the start, for firesides are bound to get a little dirty. The only alternative is to keep the excess air down as low as possible. The fact that the boilers are becoming dirty is no reason why discretion should not be used in combating this condition. It is well to remember that a little smoke is preferable to the disastrous effect of combating this condition by the usual method of increasing the blower pressure or air pressure with a greater loss due to excess air and infiltration through leaks that would be negligible under proper conditions. That also applies to baffles, particularly the first pass where occasionally a brick may become disarranged near the end of a voyage. In the writer's opinion this difficulty can and should be easily remedied. It takes only a few minutes to insert a new baffle brick in place of the one burnt out, as this pass is easily accessible. The short circuiting of gases in any boiler should never be permitted.

In conclusion let us sum up at a glance a saving of one barrel of oil a day, which is a very conservative amount and should be easily accomplished. Suppose we take the well known "535" or President type ship and see what the saving of one barrel a day would mean in dollars and cents on a voyage from San Francisco to Manila and return. The voyage from San Francisco to Honolulu requires six days. Six days at 1 barrel saving a day and fuel oil at $1.25 per barrel would amount to $7.50. Honolulu to Yokohama requires ten days ($1.25 times 10 equals $12.50). Now let us allow ten days steaming via way ports from Yokohama to Manila (10 times $1.25 equals $12.50). San Francisco to Manila amounts to $32.50. As the same time is required for the return trip we can add another $32.50, which represents our saving for the return voyage, thus bringing our total for the trip to $63. Now let us see what that means for five trips, the usual number made by each ship of this type every year—($63 times 5 equals $315). The grand total $315 is saved in one year by cutting the fuel consumption only one barrel a day. Think what this means to a company operating a fleet of ten ships—$315 times 10 equals $3150. A saving of $3150 a year for any company can be looked upon with pride by any department in its organization. Why not make it the engineering department?

The writer believes that the marine engineering profession should give this important item, as well as others that might return similar results in ship operation, some serious thought. The log turned in at the end of each voyage in the future with such savings noted will certainly make even the critic remark, "Well done!"

Use of High Pressure Steam In Marine Power Plants

By H. L. Seward,* Associate Professor Mechanical Engineering, Sheffield Scientific School, Yale University.

MAN has made progress in the art of usefully applying the resources of nature by either of two methods; accidental ingenious discovery or carefully derived methods based on scientific analysis. The early savage discovered the uses of a sail on his canoe but Flettner developed the rotor ship as an application of the Magnus theory from the laws of physics. Progress in steam engineering, while greatly dependent on experimentation, is even more dependent on scientific investigation at the present time.

In a heat power plant it is necessary that some energy be liberated and some vehicle be provided to convey the heat to a point where useful work may be done by expanding this vehicle. Since water has the highest capacity for carrying heat, it has long been used as a vehicle for heat in heat engines. It is a fundamental principle that all the heat should start from the greatest possible height and be given the maximum possible drop to the lowest possible level. If all the heat does not start at the highest level or if some of it escapes at a medium level, a loss occurs.

We are now wondering about the possibilities of getting something from the drop in the course of the higher ranges of the heat scale. We note that the heat cycle has been somewhat complicated by schemes of regenerative feedwater heating which take steam from various stages of the turbine or engine in order to transfer heat to the boiler feedwater. In some cases the steam is re-superheated after partial expansion and then returned for further expansion. We also hear of economizers and air pre-heaters.

There are power plants ashore operating at 1200, 800, 700, 550, 462, 350, and other "high pressures," so that we naturally wonder what is meant by the term "high pressure." We find that we are limited to a temperature of say 700 degrees Fahrenheit to 750 degrees Fahrenheit by the materials generally available for use in marine power plants. While man has in past ages found a way of overcoming such obstacles as are here presented in developing suitable materials to withstand higher temperatures than 725 degrees Fahrenheit, a substantial demand for such development, and some research, will be necessary. We shall find that we can accomplish considerable improvement in using the heat scale if we even now limit ourselves to this temperature on board ship. The properties of steam at 725 degrees Fahrenheit are being discovered and we may produce this temperature by innumerable combinations of pressure and superheat such as

750 lbs. abs.	212° F. superheat
600 " "	240° F. "
550 " "	250° F. "

We also note that a pound weight of steam occupies just half as many cubic feet in the latter pressure and superheat as it does at 175 pounds gauge, dry and saturated. It also contains 14 per cent more heat units per pound. Thus it is a much more compact and more crowded vehicle for heat.

One of the most comprehensive thermodynamic analyses of this subject was made by H. L. Guy before the British Northwestern Branch of the Institute of Mechanical Engineers and published in London Engineering last year. He shows that the advantages of bleeder feedwater heating and re-superheating are both a function of the initial steam pressure. While the study of his original paper is highly to be recommended, we may gain some practical points by examining Figs. 3, 4, and 8 with Tables II and III, reproduced herewith. Starting with dry steam at 200 pounds gauge pressure as a basis of comparison, and always assuming a 29-inch vacuum, the effect of using higher steam pressures is investigated, keeping a total temperature at the throttle of 700 degrees Fahrenheit in all cases. In Figs. 3 and 4 the curves are given in alphabetical order. Curve A

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*Abstract of a talk on High Pressure Steam given by Professor Seward before the Propeller Club, New York.

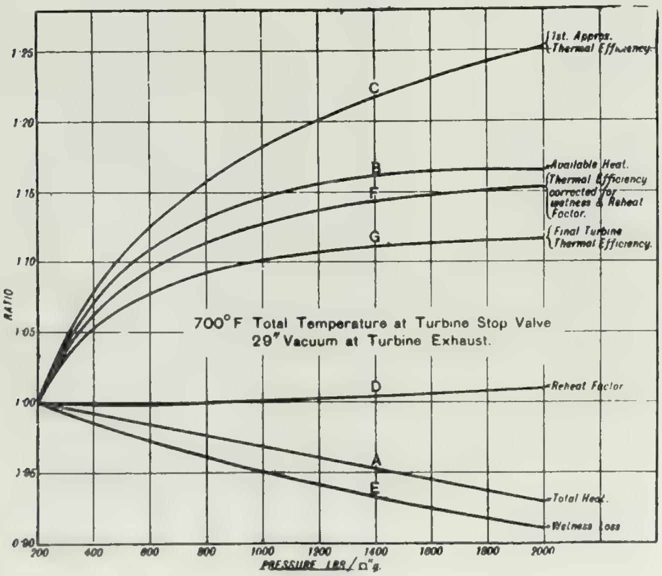


Fig. 3

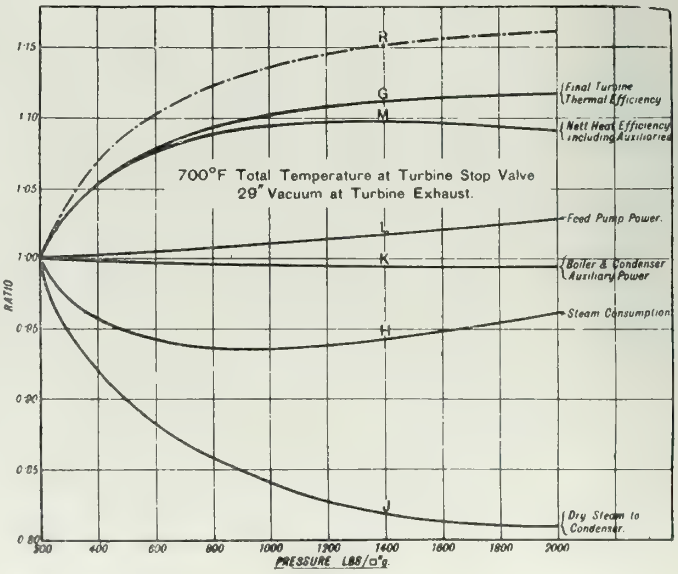


Fig. 4

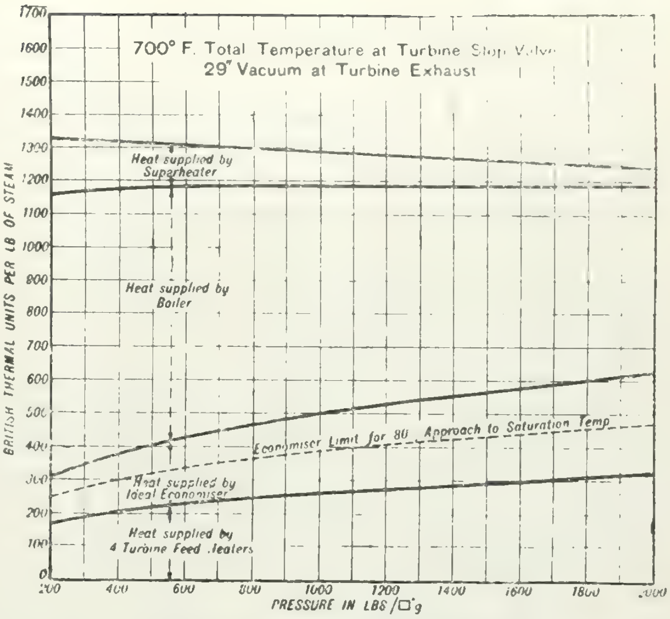
shows that the total heat of steam bears a decreasing ratio to steam at 200 pounds, a fact which might startle the uninitiated, but Curve B shows the increasing ratio in the available drop, because the heat is higher in the thermodynamic scale at higher pressures. The ratio of A and B is given in C, which is corrected by D and E to give F, the ideal thermal efficiency. Next making some assumptions regarding turbine efficiencies at high pressures, which are still subject to further investigations, the curve G for combined thermal efficiency is derived. Note that the curves have some of the characteristics of the economic law of diminishing returns in that we need not go to extremely high pressures in order to secure important gains in economy. In Fig. 4, Curve G is repeated. Corrections for the varying performances of auxiliaries as shown on the next curves are applied progressively and result in Curve M. Further studies involving four feedwater heaters show results given in Table II.

Table II. Increments of Pressure for 3% Thermal Gain. "The Engineer."

Accumulated Thermal gain, per cent.	Corresponding increment in pressure, lb./sq. in. g.	Change in pressure lb./sq. in. g.	Approximately corresponding pressure, lb./sq. in. g.
3	65	200 - 265	250
6	95	265 - 360	350
9	140	360 - 500	500
12	255	500 - 755	750
15	570	755 - 1325	1300

In Fig. 4 note particularly curve J showing the amount of steam to condenser and in Fig. 8 note the increasing importance of heating the feedwater. Table III expresses all these facts in numerical form and it is to be noted that the steam cycle may theoretically approach an efficiency of 43 per cent, but this becomes increasingly unattainable after reaching say 1200 pounds pressure. From practical considerations, it would seem extremely desirable to go to operating pressures of 550 or 600 pounds and secure very satisfactory improvements in the total cost of operation. Recent announcements in connectioon with the performance of the steamship King George V, a channel steamer operating at 550 pounds, give an over-all economy of 1.17 pounds coal, a value corresponding to 0.78 pound of oil per shaft horsepower. We should be glad to have more data on the over-all cost of operating this plant, especially the investment charges. It can be shown that with this same pressure and with further refinements in design, the fuel rates should come down to 0.60 pound of oil per shaft horsepower.

In considering the necessary equipment in a high pressure marine steam plant we may well set up some ideal characteristics. Any seagoing power plant of ordinary size, in order to be operated to best advantage by ordinary human beings, must at least have the following characteristics:



DISTRIBUTION OF HEAT SUPPLIED TO EACH POUND OF STEAM WITH REGENERATIVE FEED HEATING IN INSTALLATION HAVING ECONOMISER BUT NO AIR HEATER

Fig. 8.

(a) must be almost infallible and absolutely reliable in operation;

(b) must be easily operated and understood, in a confident manner, by available personnel;

(c) must have such a low initial cost as not to saddle the operation with prohibitive overhead cost;

(d) must have a reasonably low operating cost, which, when added to overhead cost, makes the lowest cost per ton or per ton-mile;

(e) must not be subject to extreme deterioration;

(f) must burn fuels available on routes traversed.

The load on such a plant is much more steady than on our plants ashore and so it would seem that it could be designed to take advantage of the best features of all auxiliaries and still not contain any untried gadgets. We need not think of the boiler as an exaggerated low pressure boiler but rather as a carefully designed grouping of heating surface, much smaller, placed scientifically around a furnace in which it is possible to so adjust matters as to liberate the maximum amount of heat energy. We must have flexibility in these ad-

TABLE III. Variation in Efficiency with Steam Pressure, 700 Deg. Fah., 29 in. Vacuum.

1 Initial pressure, lb./sq. in. g.	200	285.3	385.3	485.3	585.3	785.3	985.3	1185.3	1385.3	1585.3	1785.3	1985.3
2 Initial pressure, lb./sq. in. abs.	214.7	300	400	500	600	800	1000	1200	1400	1600	1800	2000
3 Superheat, deg. Fah.	312.1	282.2	254.5	231.4	211.7	179.1	152.7	130.3	110.7	93.3	77.6	63.2
4 Total heat from 32.9 deg. Fah. B.Th.U./lb.	1330.7	1326.2	1321.1	1315.9	1310.7	1300.4	1290.0	1279.9	1269.4	1259.1	1249.7	1239.4
5 Available heat to 29 in. vacuum, B.Th.U./lb.	453.2	470.8	484.1	494.1	501.6	512.3	519.1	523.6	526.3	527.7	528.4	528.2
6 Theoretical thermal efficiency	.3406	.3545	.3664	.3755	.3827	.3939	.4024	.4091	.4146	4191	.4228	.4262
7 Reheat factor (N_e = 0.8)	1.0601	1.0597	1.0594	1.0592	1.0594	1.0604	1.0620	1.0644	1.0666	1.0686	1.0701	1.0711
8 Final dryness	.9050	.8875	.8720	.8595	.8490	.8300	.8130	.7980	.7855	.7755	.7675	.7615
9 Frictional wetness loss	.0185	.0253	.0325	.0395	.0445	.0555	.0655	.0750	.0840	.0920	.0992	.1050
10 Turbine losses factor	1.0000	.9952	.9910	.9878	.9852	.9810	.9778	.9752	.9729	.9711	.9694	.9679
11 Corrected turbine efficiency	.8000	.7904	.7810	.7733	.7669	.7553	.7460	.7379	.7307	.7244	.7186	.7139
12 Corrected thermal efficiency of turbine	.2735	.2812	.2873	.2915	.2945	.2986	.3013	.3030	.3041	.3047	.3052	.3056
13 Plant efficiency without F.H.	.2206	.2268	.2317	.2351	.2375	.2408	.2430	.2443	.2452	.2457	.2461	.2464
14 Fractional gain with four feed heaters*	.0772	.0842	.0899	.0936	.0986	.1060	1121	.1183	.1243	.1302	1380	.1420
15 Corrected turbine thermal efficiency with four feed heaters*	.2964	.3070	.3157	.3216	.3287	.3340	3393	.3436	.3473	.3503	.3532	.3562
16 Plant efficiency with four feed heaters*	.2390	.2476	.2546	.2593	.2635	.2693	.2736	.2771	2800	.2825	.2848	.2873
17 Fractional power to feed pump	.0035	.0045	.0058	.0071	.0085	.0114	.0142	.0174	.0207	.0241	.0277	.0315
18 Fractional power to boiler auxiliaries	.0150	.0146	.0143	.0141	.0139	.0137	.0136	.0135	.0135	.0135	.0134	.0134
19 Fractional power to condenser auxiliaries	.0200	.0191	.0185	.0180	.0177	.0172	.0168	.0165	.0164	.0163	.0162	0162
20 Total power to auxiliaries	0385	.0382	.0386	.0392	.0401	.0423	.0446	.0474	.0506	.0539	.0573	.0611
21 Thermal efficiency of turbine corrected for auxiliaries	.2629	.2704	.2761	.2799	.2828	.2860	.2879	.2886	.2887	.2883	.2877	.2869
22 Total power to auxiliaries with four feed heaters*	.0342	.0340	.0342	.0345	.0351	.0379	.0411	.0452	.0498	.0542	.0596	.0644
23 Thermal efficiency corrected for auxiliaries with four feed heaters*	.2863	.2966	.3049	.3105	.3152	.3213	.3253	3281	.3300	.3313	.3321	.3332

* Including economiser and air heater.

Table III.

justments, due to stop and slow bells, and we will probably not want any re-superheaters to complicate matters.

The Steam Maker

Our developments with powdered coal look so promising now that it would appear that an ideal combination can be made with this form of furnace in a high pressure steam maker. We would need several feedwater heaters in series, each with thermometers and gauges so that the operating engineer can easily set these for the most economical results. This will be an operation with which he is entirely familiar.

The main steam line must be as short as possible and run only from the steam-maker to the prime mover and to the electric generating sets. As the volume of the steam is compressed one-half, both the steam-maker and all steam apparatus will be much smaller. As the turbine becomes more efficient there will be less heating surface required in the steam-maker.

The initial cost of such a steam-maker will be about equal to the cost of our present type of water-tube boiler operating at 250 pounds, even with the addition of an air preheater or some feedwater heating surface in an economizer, one of which will be necessary in order to prevent our stack gases from leaving at too high a temperature. Every 40 per cent drop in stack temperature brings an additional one per cent in efficiency.

Careful control of the feedwater must be exercised and the system must be kept tight and clean. Tradition had dictated for many years that we have an open feed and filter tank, but we should now consider a better plan of handling feedwater at this point in the cycle. All make-up water, even dock water, should be put through evaporators. These evaporators should receive their heat from turbine bleeding and can be worked into the general scheme of heat transfer in an economical manner. High pressure plants ashore have successfully worked out this problem from a practical as well as a theoretical point of view.

Auxiliaries

All auxiliaries will probably be electrically operated by a few standardized sizes of motors, receiving power from an electric generating unit which contributes exhaust heat at the proper point in the heat scale to the feedwater. It is not desirable to lead high pressure steam pipes all over the ship, when copper wires can be more profitably used.

A steam driven feed pump and other steam units as stand-by equipment may be desirable. There are many schemes proposed for bleeding auxiliary steam from the main turbine at suitable pressures but these all depend on an automatic governor going into operation when the main unit is in maneuvering control. There is a profitable field of study in connection with mechanically driven auxiliaries so connected to the main unit that an automatic shift-over to electric drive is made during maneuvering. Where heavy deck machinery loads are to be served, as in Lake ore carriers, a high pressure electric drive plant throughout can be built which really operates much like a central power station ashore.

The matter of insulating materials for the higher temperatures has been given careful attention and that problem has been solved.

The Prime Mover.

While one naturally thinks first of a steam turbine as the prime mover, the one reliable piece of apparatus in the older types of plant is the reciprocating steam engine. When carefully designed, it holds a record for unit economy. It has more chance of being useful at high pressures than at extremely low pressures. Mechanically it is understood by all our personnel and should not be overlooked in this connection. We shall, however, have some difficult problems in design to meet in connection with metal expansion and lubrication if we go to higher pressures.

We have trained our personnel in new types of equipment, sent them to sea knowing full well that their ingenuity and resourcefulness would somehow overcome almost insuperable difficulties and then wondered why the upkeep or repair bills were so heavy. We must take advantage of all accumulated engineering experience to the fullest possible degree, and it would seem that in high pressure steam there is not so much that is new and terrifying to the average available personnel. Operating engineers ashore report no difficulties with such apparatus as safety valves, stop valves, flange welded joints, insulation, superheaters, economizers and other parts of the plant where one might expect that design might have been slighted because of more enthusiasm directed at the main units. A well engineered job is thoroughly attainable in high pressure steam marine plants if advantage is taken of experience gained ashore.

We have now many types of power plants in process of development for application to marine propulsion. In the course of events, each will find its best field of application in the large or small, fast or slow, long or short route, freighter or liner, navy, yacht, submarine, tug boat, lake or ferry vessel. The solution of the "one best way" will, in each case, be reached by the economic facts developed by experience in actual operation wherein all cost data are carefully studied.

There is a great difference between "efficiency" and "economy." The engineer has not completed his job when he has produced an "efficient" device with a high thermal efficiency and using but few B.t.u. He must also make it cost so little more to install than present equipment that the total cost in dollars per mile or per ton is less than at present. It may be wiser to use more B.t.u. to spend less dollars. The operating manager is obliged to look at the **total** of all costs, operating plus fixed charges, on the capital invested, and is not concerned with the "efficient" plant which costs so much more to operate.

The message brought to this Club at our last meeting by Mr. N. F. Titus should be repeatedly emphasized. In connection with simple cost accounting as developed in good business practice ashore, he said:

> "One of the outstanding achievements of industry has been the development of the science of cost accounting. This field is practically untilled in the shipping business. Many operators imagine that they have adequate cost accounting systems, but if they would examine the scientific systems pursued in industry, they would realize how elementary were their own methods. One well-known operator has stated that his fleet has been kept in operation, at extremely low rates, chiefly through a most rigid cost accounting system reducing all operations to a ton-man-hour basis. This not only compared terminal and ship with ship, but disclosed the efficiency of all workers

(Continued on Page 177)

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The Basic Principles of Advertising in Foreign Trade

By Frederick Sturgess, Mgr., Publicity and Advertising, McCormick Steamship Company.

HOW many of us in viewing San Francisco as a foreign trade center, a world city, a key port to the United States; how many of us seeing the ships that pass by day and by night through the Golden Gate realize what each one means to our own business, our payroll, our profits .and in turn what credit do we give to that very important item that is so much a factor in the individual, community, and national life of all? I speak of advertising.

To do more than merely approach this important subject in its bearing on our commercial intercourse with the rest of the world is of course quite impossible. To discuss in any detail domestic and foreign advertising comparisons, their field, scope, functions, and actual results, could only be accomplished, not in minutes but in hours. To touch on publicity methods in South America, advertising plans for India, or suggestions for merchandising oranges in Siberia is not my mission at this time. To render as great a service as possible in a short period, I will speak of advertising in foreign trade purely from the point of view of its fundamental or cardinal principles.

Even to the casual observer it is obvious that advertising has undergone great changes in recent years. The volume, the type, the form, the style, and even the purpose of advertising have altered in conformity with modern business requirements and standards in all countries as well as in the United States.

Advertising is as necessary to trade, both domestic and foreign, as steam is to an engine. It used to be said that "competition was the life of trade"; but it is now recognized by all students of modern methods that the life of trade is advertising. Good publicity is vital to all foreign business. In other words publicity is the pioneer that goes ahead; the herald that proclaims his champion; the artillery, handled easily and rapidly by the directing minds behind the lines that clears the way and removes obstructions for the advance of the soldier—Production.

Evolution of Advertising

Advertising, like science, commerce, and transportation, follows an evolutionary process. In earlier days when our forefathers walked, or relied on horses as a means of transportation, when they made their own clothes, lived in small communities, and when none but a few adventurers went far afield, the chief advertising medium was the town or village crier, a long whiskered gentleman with braided coat, who announced his news after calling attention by the loud clanging of a bell. During the intervening period, advertising has undergone many changes, until in our present time we are using wireless, radio, motion pictures, aeroplanes, and all the later products of scientific research as the framework of our selling and advertising structure.

From the fundamental point of view of foreign economics, advertising is the bridge used to help establish the contact of mind with mind, upon which the whole organization of the marketing process is based. In export trade, it is therefore absolutely necessary to thoroughly know the desires of the foreign mind in order that the bridge of advertising may rest on a sound foundation. Sometimes it seems that the element in our foreign economics on which we are apt to place too low an estimate is the true understanding of exactly what the foreigner really wants.

Advertising Goals

The goal of all advertising is to establish demand, and its function in the complete selling process is to reduce sales resistance by actually creating desire, or demand, for a service or merchandise.

During a recent visit in the Northwest, a leading manufacturer stated to me that what he required was someone to go to South America to educate the people into using what he had to sell so that he could dispose of his surplus products. I submit that those who regard foreign trade as a dumping ground of this nature are entirely wrong, and it would be better to turn their attention to something requiring less thought and intelligence.

The reason why so large a part of the public in all lands does not have a fuller appreciation of the services rendered by advertising is because popular attention has been confined to its narrower phases. Many people regard advertisers as seeking only to increase their own profits, especially by attracting trade from one another. To these people, the advertisers seem merely to be fighting with one another over the division of the consumers' money, and therefore, these people look upon efforts spent in advertising as largely wasted. On the other hand, we all know of many cases where companies have gone out of business through lack of proper advertising, and others where they have made great success through the right kind and amount of publicity.

Publicity Methods

My experience in years of the sales promotion end of business, both at home and abroad, has no doubt been similar to that of many others, and summed up, has been productive of the following crystallized results:

1. Be sure to know your market and to whom in that market you can sell. Know your market—don't guess.
2. Carefully study the nature of appeals that go over in the foreign country that you are dealing with and forget your own prejudices.
3. Be certain of the most effective presentation of your appeals.
4. Carefully choose your mediums through which to make these appeals.

President Coolidge speaking before the Advertising Association of America recently remarked somewhat as follows:

"American leadership in industrial development, with its reduction in costs, is largely explained through mass production, which in turn is only possible through mass demand, which is, again, the sequel almost entirely of sound advertising methods."

Advertising is, therefore, not an economic waste, but to the contrary, as a whole, performs a very useful social service, and is an indispensible part of the modern process of marketing goods among masses of people at home and abroad. Thus it ministers to the true development of our trade.

The vital importance of adequate advertising is better understood when we appreciate that in many lines excess plant capacity has brought about price disorganization and impaired profits. In other words, we require more markets. Attention to production has displaced consumption as the all important problem. Without increased markets, we encourage over-supply with all its demoralizing influences. Under present conditions, even greater attention should be devoted to markets than to production. Unless we understand our markets, how can we produce for them? Goods can be manufactured, but they cannot be sold at a profit unless first the buyers approve the merchandise and, second, unless it is scientifically marketed. The next ten years at least will be an era of merchandising.

Service and Merit Basis

I believe that it is only a question of a short time now when those interested in our foreign trade, which has always of necessity received very secondary consideration, will take many pages from the book of those successful industries that have attained great prominence in other fields of commercial achievement in the home market. When the same thoroughness in studying the foreign customers' needs from all angles is shown by our exporters and potential foreign traders, as has been so carefully and intelligently exploited in the home market, and when our design, shape, and quality, as well as our methods in sorting and packing, approach more nearly the needs of the consumer abroad instead of merely fitting in without equipment, and when our cargo handling is improved to the extent that it does not show the same terrific loss through shortage and damage as official statistics indicate at present, with its consequent disappointment and annoyance to the consignee thousands of miles away, **then** we are aiding several fundamental factors in our advertising structure that are just as essential as good copy. Do not let us forget that primarily advertising depends on having a worth while service or article to sell, and that advertising of itself cannot create a single point of superiority in a product or add a single virtue to its manufacturer.

The only permanent basis for advertising and sales promotion or publicity is that it be synonymous with exact truth, for whenever fraud or misrepresentations find foothold, they eventually loosen the whole foundation and sully the art itself. If our business life is to be wholesome, fresh, and continue on a permanent basis, it will be as a result of the ideals and efforts of those who desire such ends, and all indications are that in the development of our great country these vital principles of truth are the foundation for the expression of both our present and future commercial and national greatness.

Is Ship Fumigation a Logical Government Job?

A Discussion of Government Methods and Some Fumigation Troubles

By Roy W. Kelly

THE fumigation of ships engaged in foreign trade was undertaken by the U. S. Public Health Service to control the bubonic plague. The rats and fleas which are carried on ships spread this disease and a few other diseases not quite so dangerous to human life. Fumigation, if properly carried out, also serves to keep the number of cockroaches, bedbugs, lice, and fleas found on board ship, down to a minimum. Fumigation every six months with the full dosages recommended by government regulations not only kills all mice and rats and live insects, but it also kills the greater part of the eggs of insect pests.

In San Francisco, for example, the Public Health Service is now fumigating with three different methods. Liquid cyanide gas, mixed with another gas which is similar to tear gas in its effect, is quite widely used. Although this method of applying the gas is simple, it is quite expensive due to the fact that the material is usually shipped long distances by truck and must be kept iced in hot weather. Under certain conditions it is explosive and dangerous to handle.

The second method is by using a mixture of sodium cyanide and sodium chlorate treated with hydrochloric acid. This involves the use of a considerable number of wooden kegs which must be carried on board the ships by the fumigating crew. Oil tankers are often fumigated while lying in the bay away from the dock. It is difficult to get either the liquid cyanide gas or the second materials mentioned on board the tankers. Accordingly these ships are now being fumigated by the old "pot method," which utilizes sodium cyanide with sulphuric acid. This method is extremely dangerous and has caused many deaths. Several years ago the chief inspector and four assistants for the U. S. Public Health Service were killed while fumigating the T. K. K. liner Shinyo Maru.

Detail of Fumigation Service

The government has a considerable amount of money invested in this fumigating service. Its plant on Meigg's Wharf in San Francisco, for example, has a considerable stock of cyanide, a large amount of pots, kegs, gas masks, and other equipment used in fumigating, grinders and mixers and other machinery. Thirteen men besides the chief foreman and the chief in-

Continental Stations	6607	vessels fumigated or disinfected
Insular Stations	534	" " " "
Foreign Stations	2191	" " " "
	9332	

Vessels Fumigated at National Quarantine Sta. (Continental (Insular

Method or Fumigant	Yellow Fever	Rodent Plague	Human Plague	Small Pox	Leprosy	Total
HCN	1	2149	198			2348
SO_2	5	1952	2			1959
CNCl	3	2702			1	2706
HCN & SO_2		24				24
HCN & CNCl		[illegible]			1	[illegible]
Formaldehyde & SO_2					1	1

Table showing number of vessels fumigated at U. S. Government stations during the fiscal year 1925.

spector are carried on the monthly payroll. All of this means a large expense with no obvious means of adequate control.

A number of complaints are made by ship owners and operators regarding the present fumigation methods. Ships are accepted for fumigation only between the hours of eight and eleven. If a ship comes in at noon or a little later, it has to wait until the next day. It requires from two to four hours to fumigate and another two to four hours to gather up the equipment and air out the ship so that the crew can get back on board. Due to the fact that ships must wait their turn to be fumigated, delays from one to three days are not uncommon. Ships lying south of Pier 54 in San Francisco Harbor are not accepted for fumigation, and must be moved before the Public Health Service crew will go on board.

Dosage Control

Perhaps the chief cause for complaint is that there is no proper control of the dosage of cyanide used. The work is apparently carried out very carelessly, with the result that the eggs of cockroaches and other pests are not killed. This means that the ship operator must go to considerable expense to get rid of these pests by other methods, such as steaming or the use of various insecticides, all of which involve labor, expense, and damage to the ship.

An examination of the charges made for fumigation show some very strange discrepancies in dosage. The following are typical figures taken from the records of a company operating oil tankers. The first column shows the number of cubic feet fumigated and the second the number of pounds of cyanide used.

Cu. ft.	Lbs. of cyanide
49,000	16½
18,000	9
73,000	11
70,000	22
87,000	13
86,000	12
92,000	35

The government officials state that the materials used in fumigation, if provided in sufficient quantities to kill all eggs, should not exceed 9 cents per thousand cubic feet. As the charge may run from 40 to 50 cents per thousand cubic feet, this shows that labor and overhead are by far the most important reasons for high fumigation cost.

Recommended Change

In 1925 the American Steamship Owners' Association, in conjunction with the Pacific American Steamship Association and Shipowners' Association of the Pacific, passed the following resolution:

> "Quarantine stations at many ports are inadequate and contribute to delays and increased costs of operating American ships.
>
> We accordingly recommend:
>
> That quarantine stations be established at all principal ports of the United States and its possessions, or, where this is not practicable, that fumigation by competent private companies under regulations prescribed by Public Health Service be accepted when such fumigation is performed, and evidence thereof is certified as required by the Bureau of Public Health."

To carry out this suggestion, the following steps should be taken:

1. **The government should adopt and enforce more accurate inspection methods. More exact figures should be secured as to the amount of cyanide which should be used for a complete kill under varying conditions. Fumigating crews should be forced to live up to the requirements in the use of materials.**

2. **The present practice of fumigation by the Public Health Service should be discontinued. The work should be done by private cyanide companies. These companies should be carefully examined as to liability and equipment and should be made subject to certain restrictive regulations. All fumigators should be provided with a license by the Public Health Service.**

3. **The Public Health Service should employ only inspectors who go on board the ship at the time the fumigation is to be carried out and thoroughly check the job. Under present conditions both the inspection and the fumigation are done by the same department of the government, with the result that there is absolutely no check upon connivance and fraud.**

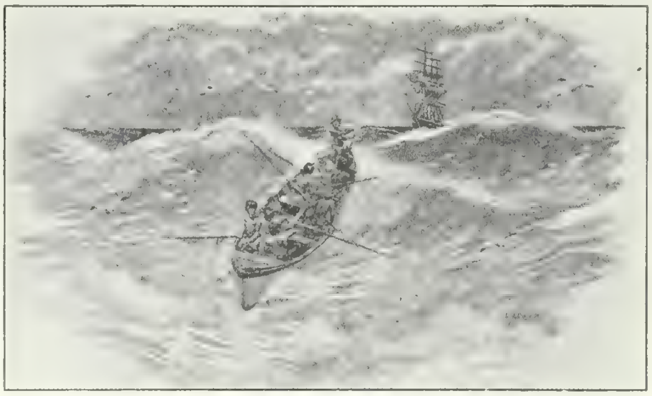
Investigation shows that the government, by competing with private companies doing fumigation work, has driven several reliable firms out of San Francisco and other ports. If the government got out of this business, it would unquestionably open up a good field for private enterprise, particularly in view of the fact that a number of different fumigating materials are on the market. The government is placed in a bad light, because it must buy from a number of competing manufacturers of cyanide products, which gives rise to additional temptation placed in the way of those who do the purchasing and the fumigating for the government.

High Pressure Steam

(Continued from Page 174)

and gangs of men together with the conditions of winches and other equipment. How many operators can point to such methods?"

It is high time that there be an opportunity to gather operating records on over-all costs of a medium sized marine power plant with high pressure steam. The initial cost of the whole plant would appear to be from 50 to 65 per cent of the initial cost of a diesel direct connected plant and but little more than present steam plants. The possibilities of economy in fuel costs seem attractive if the plant is carefully designed. More operating personnel are available for this type than for any other type of plant. Only after a few years' experience in actual operating service shall we be able to say whether or not we have, for the time being, discovered "the one best way."



Hamilton-M.A.N. Double-Acting Diesel

The Hooven, Owens, Rentschler Company 3300-Horsepower Unit Successfully Completes U. S. Shipping Board Thirty-Day Nonstop Test

THE Hooven, Owens, Rentschler Company has just completed the building and the 30-day non-stop test run of a double-acting, 2-cycle, Hamilton-M. A. N. diesel engine for the United States Shipping Board. This engine will be installed in the Seminole, a 9600-ton cargo ship, and forms part of the conversion program in which the Shipping Board has been engaged for the past two years.

The engine develops 3300 horsepower at 95 revolutions per minute. This power, however, can be increased to 4500 by running the engine at maximum speed.

The diameter of the cylinders is 27½ inches and the stroke is 47¼ inches. The engine has four cylinders and, in addition, there is driven direct from the crank shaft a 3-stage compressor for air injection and a twin scavenging pump for scavenging the exhaust from the main cylinders.

Air injection is used and each cylinder has one fuel valve located in the upper head and four fuel valves located in the lower head. In addition, there are starting valves, both on top and bottom, and relief valves.

The engine operates on the patented M.A.N. system of scavenging. Each liner has two sets of ports on the same side; one directly above the other. The lower ports are the scavenging ports. The air is blown in across the top of the piston and forced to the top of the cylinder, then exhausted through the exhaust ports directly above the scavenging ports. This system has been thoroughly tested and has proved exceedingly efficient not only in the preliminary investigation but in engines already in actual operation. The angles of the ports directing the air are carefully made so as to be able to bring the air current to every part of the cylinder.

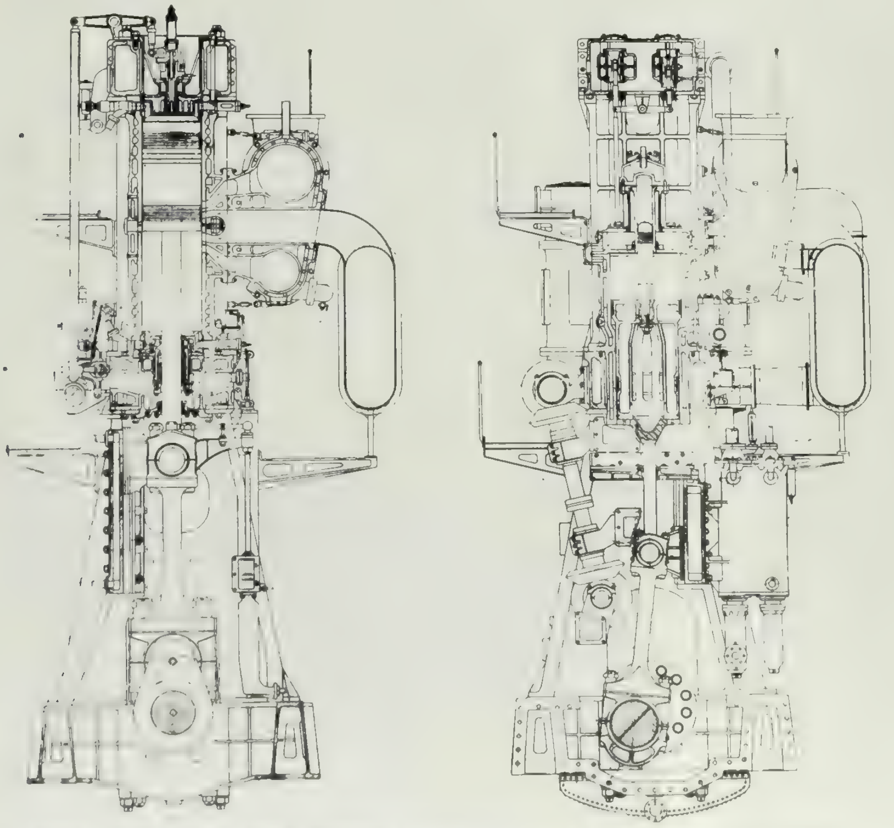
In construction the engine is made up of a bedplate with wide and deep sections. Directly on top of the bedplate are the housings which are bolted to the top of the lower entablature which is of a heavy, cast-iron section and extends the entire length of the engine. On the upper face of this entablature are set the cylinder columns which again tie into the upper entablature. The upper entablature is of similar construction to the lower, of a deep section, and goes the entire length fore and aft of the engine. In addition to all these joints being held by bolts, there are also four tie bolts for each cylinder which extend from the bottom of the bedplate to the upper part of the upper entablature.

The cylinder jackets are set in between the columns, and inside of the cylinder jackets are liners made in halves—one for the upper and one for the lower. To the lower entablature is bolted the cylinder jacket and to the upper entablature is bolted the upper cylinder liner. The cylinder liners are so arranged that there is an opening in the center giving freedom of expansion. The cylinder jacket also has freedom of expansion and contraction through a stuffing box bearing on the upper liner. The idea of the entire construction is to make a solid structural design in which all the tensile stress is absorbed by the tie rods. By tieing the various members both athwart ship and fore and aft this design gives the entire engine a rigidity which eliminates weaving or vibration and at the same time gives freedom of expansion to the liners and cylinder jackets which are subjected to the heat of combustion.

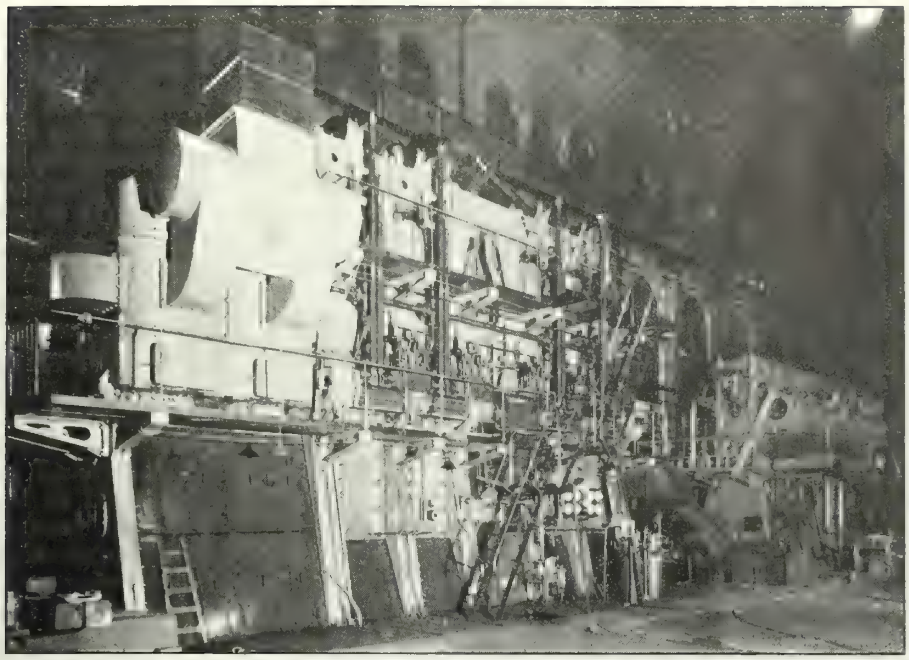
The air compressor is of the conventional 3-stage type driven from the crank shaft through connecting rod and guide with cross-head. The pistons are of the step design with the high pressure on top, the low pressure in the middle, and the intermediate at the lower end. The air is cooled between the stages through coolers, which are provided with water separators so as to draw off the moisture from the air between each stage.

Scavenging pumps are of the double acting type with plate valves particularly designed for low air pressure. They are driven through crossheads direct from the shafts.

Fuel and starting valves, both for the upper and lower cylinders, are driven from the cam shaft located in the middle of the engine, fastened to the lower entablature.



Sections through cylinder and air compressor of the Hamilton-M.A.N. double-acting diesel engine.



Hamilton-M.A.N. 3300-horsepower, double-acting diesel on the test floor at the Hamilton, Ohio, works of the Hooven, Owens, Rentschler Company.

The cam shaft receives the motion from the main shaft through a set of spur and bevel gears.

Reversing is accomplished by moving the cam shaft longitudinally, and a complete extra set of cams is provided on the cam shaft for the astern motion. The cam shaft is moved by means of a ram operated by compressed air.

Fuel pumps are located on brackets directly above the cam shaft and are driven from cams on the cam shaft. This feature is novel and gives a timing to the fuel pumps which makes possible a closer regulation of the engine. There is one fuel plunger for each upper and lower cylinder.

The operating gear for the engine is located on the lower platform and consists of one lever which completely operates the engine for starting, reversing, and stopping. The operation is carried by means of high pressure air to the main starting valve and reversing engine. In addition, there are located on the operating platform one lever for regulating the amount of fuel and one lever for controlling the amount of air for the air compressor. Injection air pressure is controlled by a small handwheel.

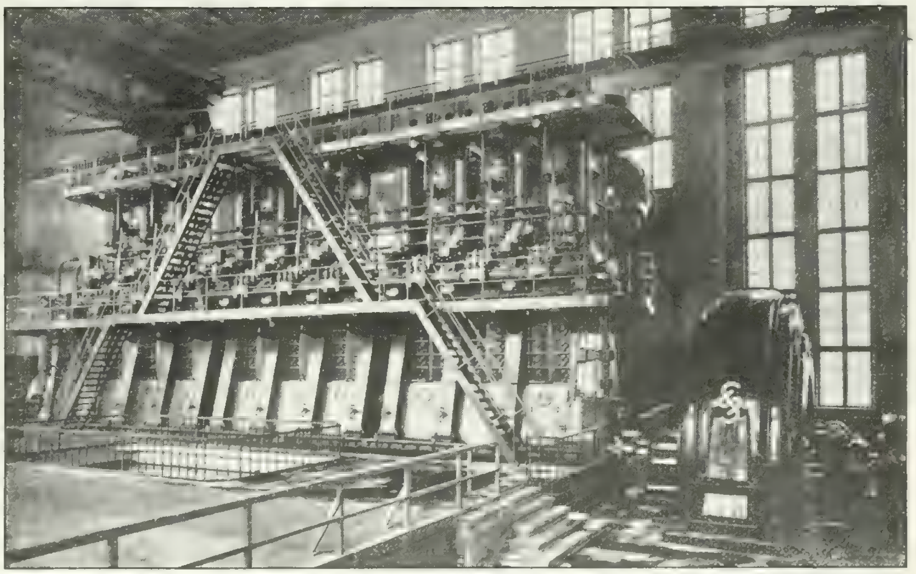
The engine is provided with an over-speed governor of the Aspinall type. The regulation of the engine is accomplished by by-passing the discharge valves on the fuel pump. Starting valves are automatically cut out as soon as the engine gets sufficient compression for igniting the fuel. The entire engine is enclosed and subject to forced lubrication and a complete system of water cooling so arranged as to give the proper circuit and speed of water where rapid extraction of heat is required.

The piston is cored out and the piston rod is hollow for circulating of the cooling water to the pistons. The inlet and outlet of the water is through telescopic piping driven from the crosshead of the engine and working through stuffing boxes into air chambers so as to absolutely seal the water from getting into contact with the lubricating oil.

The engine, including scavenging pump and compressor, weighs approximately 850,000 pounds. The length of the engine is 40 feet; width, 15 feet; height is 28 feet, above center of shaft.

Although the first engine of this design was completed a little over a year ago, there are already under construction in this country and abroad engines to the extent of 77,000 brake horsepower. Included in this program are the engines for the Augustus, which will be the largest motorship in the world, recently launched in Italy, equipped with four 6-cylinder M.A.N. main engines each of 7000 brake horsepower, a total of 28,000 brake horsepower on four screws.

The most notable example is the 15,000 horsepower engine installed in the Hamburg Electric Light Station, Hamburg, Germany. This engine is in design exactly the same as the one the Hooven, Owens, Rentschler Company has built except the cylinder sizes are larger being 34-inch diameter by 60-inch stroke, and the engine consists of nine cylinders with attached compressors but with separate scavenging pumps. This engine was recently subjected to fuel tests, and at full load the fuel consumption per brake horsepower was 0.372 pound, excluding the scavenging blower. It was found to be 0.394 pound per brake horsepower including the scavenging blower. The thermal efficiency, referred to brake horsepower, was found to be 37.5 per cent excluding the scavenging blower, or 35.7 per cent including the blower.

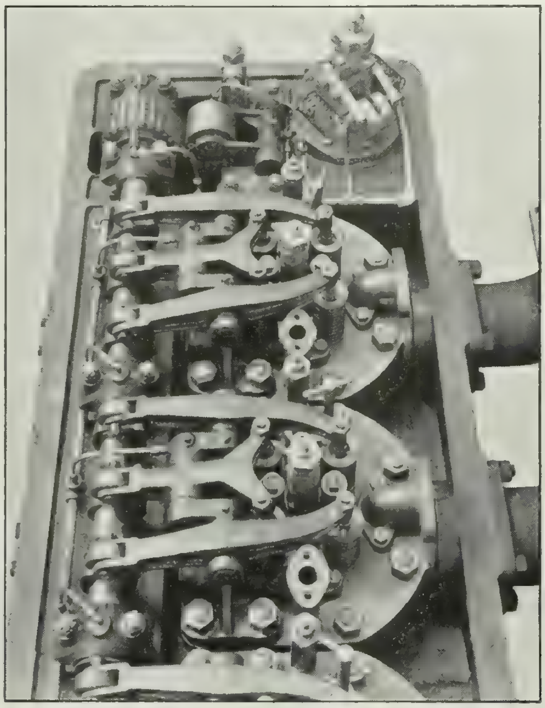


The world's largest diesel engine and the world's largest diesel-driven generator in the Hamburg Electric Light Station, Hamburg, Germany, 15,000-horsepower on nine cylinders. This engine has been in satisfactory operation for the past seven months.

A Novel Light Weight Diesel

OF the many interesting developments in the diesel engine industry during the past several years, perhaps the most outstanding is that of a light weight medium high speed diesel engine recently completed by the Foos Gas Engine Co., Springfield, Ohio, and designated as the Foos Type L diesel engine.

The Foos Type L diesel engine incorporates in its design and construction many important features, all of which add to the economy and simplicity of operation and to the operating life of the engine. These new features are the result of forty years' analysis, test, and experience in the design and construction of internal combustion engines exclusively.



View of the head of Foos Type L diesel engine, with cover removed, showing arrangement of valves, valve gears, cam shaft, and chain drive.

To attempt to point out which new feature is of most importance is a difficult task, since all are closely related in achieving the accomplished goal. Full diesel economy with standard diesel efficiencies may be expected since the engine is of the four-cycle type, using the solid injection fuel system. The former item aids greatly in securing economical operation, while the latter reduces to a minimum the simplicity of operation and control and furthermore eliminates the many complications encountered with the use of air for fuel injection. On the Foos diesel the latter is accomplished by small individual pumps, one for each cylinder, inter-connected with the governing mechanism. This arrangement prohibits the overloading of any one cylinder.

Economy in attendance is a prime factor in cutting down operating expense, and the Foos Engineers, in working out the design of the Foos diesel, took into consideration every detail which might have a bearing on this question. The unit is lubricated by a fully automatic circulatory system even to the valves, valve gear, rocker arms, and rollers. The lubricant is picked up from the base by a pump driven from the cam shaft and distributed under pressure to every moving part. Not a single oil or grease cup is to be found in the engine. To serve a dual purpose of preventing loss of lubricating oil and of protecting moving parts from coming into contact with foreign matter, the engine is completely enclosed. This is a decided feature and an advanced step in diesel engine practice. All moving parts are fully enclosed, with the exception of the main driving shaft, even the fly-wheel being enclosed.

While fully enclosed,the engine is yet readily accessible. Large cover plates are provided on both sides opposite the crank throws which give access to the lower part of the main cylinder frame, bearings, and crank case. The top of the engine is provided with cover plates for inspection of the head, valves, and valve mechanism.

The physical characteristics of this unit are most attractive. Low height, narrow width, and small length of the complete unit permit its installation on small yachts, cruisers, and other vessels with minimum alteration to hull.

The Foos diesel engine operates on the full diesel combustion cycle. A cross section of the engine indicates a plain combustion chamber, the head being perfectly flat, there being no recesses or precombustion cups of any type. Injection of the fuel is vertical, at the axis of the cylinder. Complete atomization of this fuel, causing a low fuel consumption with clear exhaust, is secured by the use of the Foos mechanical injection principle.

The matter of valves and valve gear received considerable attention from the designing engineers. In the Foos Type L diesel the dual valve system is provided with two inlet and two exhaust. The use of dual valves provides maximum oxygen for good combustion and re-

(Continued on Page 17, Advertising Section.)

Four cylinder Foos type L diesel, 130 horsepower at 600 revolutions per minute.

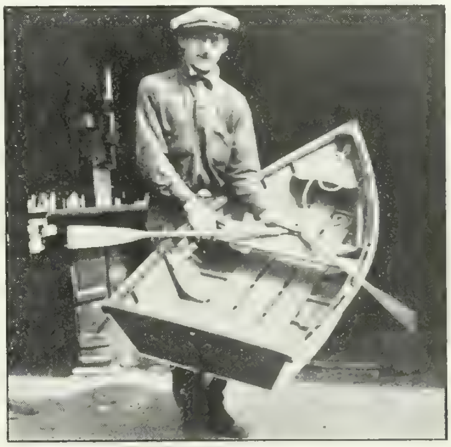
Pacific Workboats and Their Power Plants

Workboat and Engine Notes

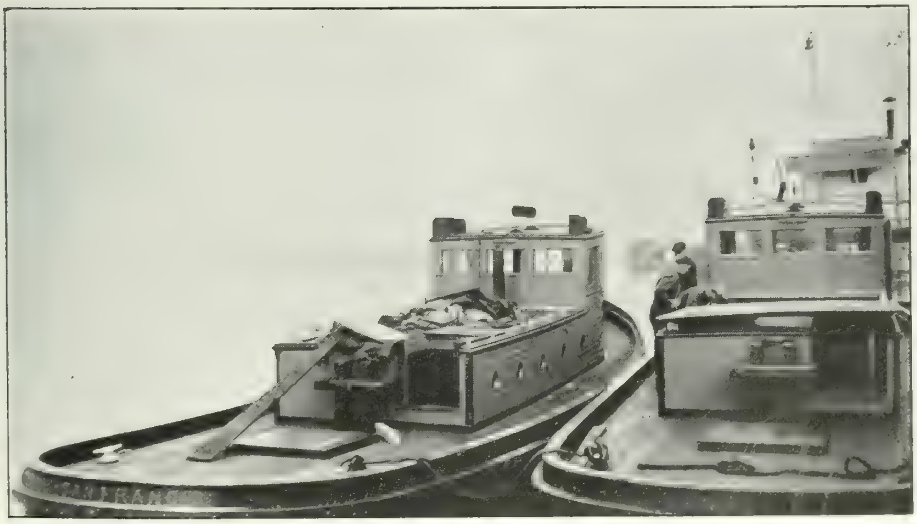
Atlas-Imperial diesel engines, to the number of 42, were sent out from the Oakland shops of the Atlas-Imperial Engine Company during the month of March, and 32 during February. All of these units were for vessels along the Pacific Coast, of the United States and Canada, Hawaii, South America, Australia, and China. The powers ranged from 35 to 300 horsepower. The outlook for increased business is bright. Besides the shipments of diesel engines as above mentioned, about 150 gas engines of smaller sizes were built.

William Cryer & Son, boat builders of Oakland, California, have completed the fishing tugs Teal and Rail for the Alaska Packers' Association. These boats are of the latest type and are exceptionally well built of hardwood and bronze. They are equipped with the new type Atlas-Imperial 50-horsepower diesel engines.

This yard has also received a repeat order for another workboat for the Alaska Packers' Association of the same mold as the Teal and Rail, but will be 5 feet longer and powered with a 75-horsepower Atlas-Imperial diesel engine. With this power and added length, she will be a fast and powerful craft. All three of these boats will be taken to Alaskan fishing ground for the summer fishing season.


Five-foot rowboat, built by Twohy Brusstar at the boatyard of Wm. Cryer & Son.

The smallest practical "workboat" in the West, and perhaps in the world, has just been built at the boatyards of William Cryer & Son. This little craft, shown in the accompanying photograph taken by Pacific Marine Review representative, is 5 feet over-all, and in every particular, except size, is exactly like the regular 15-foot boat built at the yard, so well known by San Francisco waterfront folks. She was ordered from William Cryer by Grant Miller, coroner of Alameda County, California, as a present to his young grandson, the youngster having developed a taste for navigation. The little boat will be used by the boy in navigating the swimming pool on his grandfather's estate. The artisan who cleverly built the craft is Twohy Brusstar, one of the mechanics at the boatyard. Twohy took the vessel out on her trial trip, acting as motive power and pilot, to show that the craft was seaworthy and sound before her youthful owner risks himself on the perilous waters of the pool.


The new fishing tugs Rail and Teal, built by Wm. Cryer & Son for the Alaska Packers' Association.

Robertson's Shipyard at Alameda, California, has a rush order for two barges for the Bristol Bay Packing Company of Alaska. These will be 65 by 22 by 6 feet and will be used for transporting fish from the fishing ground to the canneries. The barges will be towed by the company's workboats as they are not self-propelled.

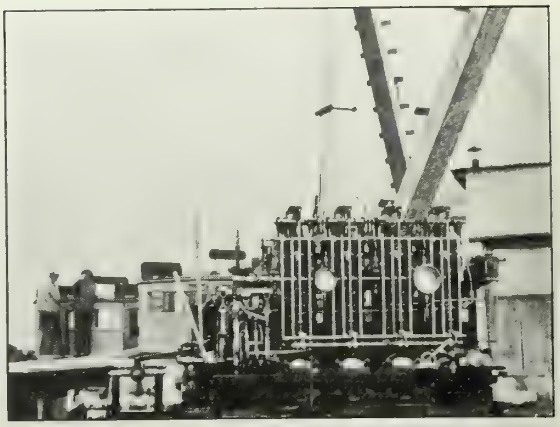
This yard has just built a dredging barge for Captain S. Dutra of Napa, California, who is engaged in general dredging operations on San Francisco Bay and tributary bays and rivers. This dredge will handle about 3000 cubic yards per day, the machinery being moved by a 75-horsepower Atlas - Imperial diesel engine. She is very well fitted up in the way of living quarters for the crew. Two electric light plants will insure permanent current for these quarters, as well as for the big flood lamps for night work. All quarters are screened against the Delta mosquito, which is a savage beast at times, and screening is necessary for protection against the pests. Captain Dutra also owns and operates the dredge Mallard, somewhat smaller than the new dredge Edward (named after the Captain's son.) All construction work on the Edward was supervised by the owner.

The Oakland yard of **W. F. Stone & Son** has an order for a duplicate of the new cruiser Aloha, just commissioned. The Aloha is ketch rigged, Marconi style, and is fitted with a kicker built by Scripps-Booth of 20-30 horsepower. Her heavy spars and wide sail spread will make her fast in a good breeze, though comfort has not been lost sight of in her design. The Aloha, like the one to follow, has been built for family cruising at sea.

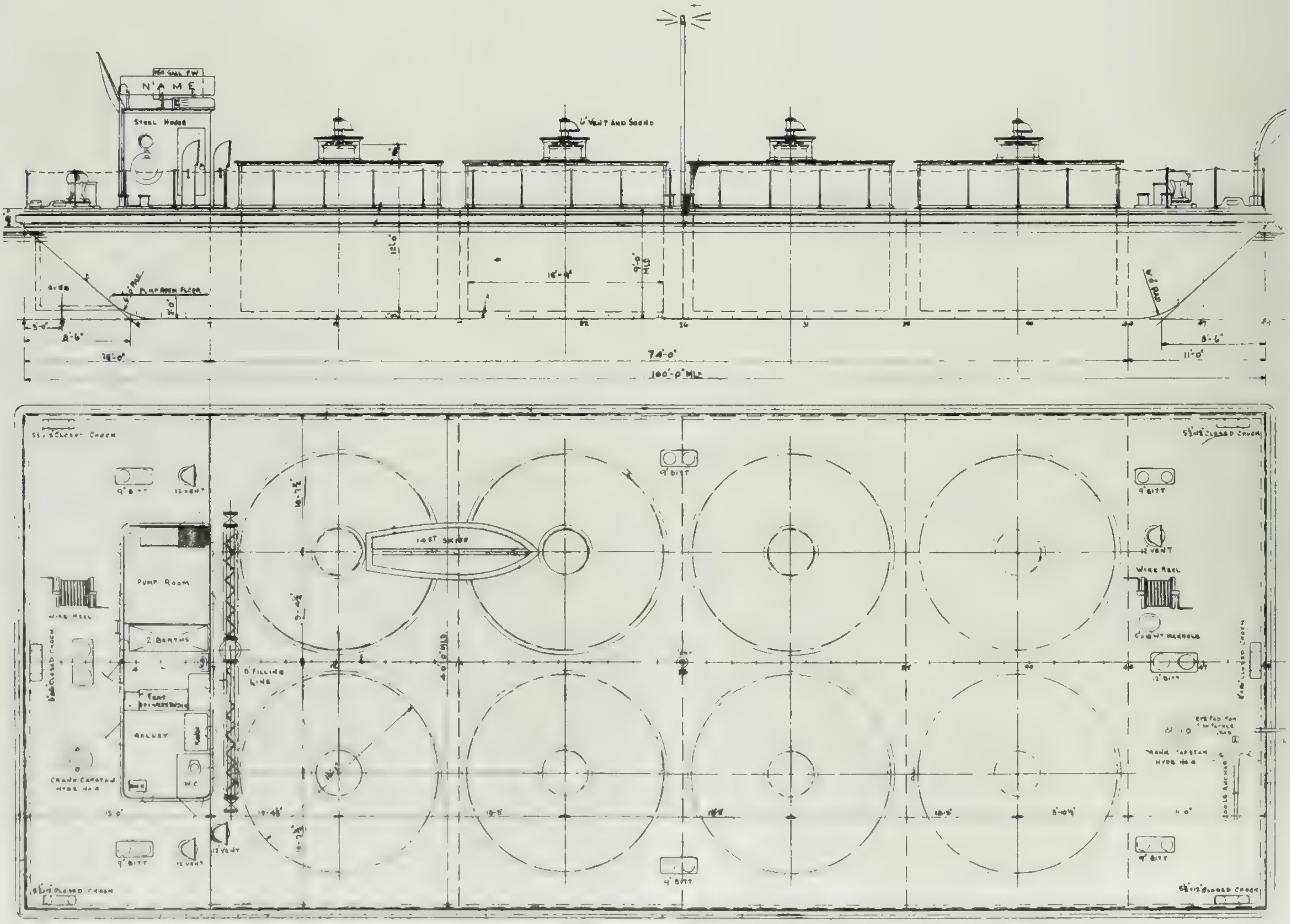
Stone's yard is to build two 75-foot seagoing tugs for the Crowley Launch & Tugboat Company of San Francisco. These will be powered with Pacific diesel engines of 200 horsepower each. The tugs will be a fine addition to the present Crowley fleet.

Capt. Frank B. Peterson, head of the Red Salmon Packing Company, whose Alaska interests are at Naknek, has ordered from **Wm. Cryer & Son**, Oakland, a 50-foot fishing boat to be delivered in April for service at the cannery. This vessel will be powered by one of the new type 3-cylinder **Atlas-Imperial** diesel engines of 75 horsepower. Hull construction will be of highest class, finished in hardwood and non-ferrous metal, insuring long service.

Four-cylinder, 50 - horsepower, Atlas-Imperial diesel engine on the outfitting dock at the yard of Wm. Cryer & Son, Oakland, California, ready for installation in the fishing tug Rail. A similar engine goes into the boat Teal.



Mr. L. Bradbury, of San Francisco, has placed the big workboat Herron in the hands of **Wm. Cryer & Son,** Oakland, with an order to rebuild the vessel into a commodious seagoing pleasure cruiser. Formerly the Herron was a heavy and fast tug, but her then owners put her into the rum running game. Her career at this was cut short as she was captured by one of the Coast Guard cutters. Condemned as a prize and sold, she was bought by Mr. Bradbury. This gentleman, knowing the hull was a fine one, will now have her fixed up in a most complete manner. Cryer's Yard will attend to the rebuilding, and a new **Union** diesel of 100 horsepower will be installed, together with fuel tanks of capacity sufficient to ensure a cruising radius of over 6000 miles. **Ets-Hokin & Galvan** of San Francisco are attending to all the electric installation, which will include an independent Delco electric plant of 850 watts at 32 volts. A **Westinghouse** generator of 1000 watts driven off the main engine at the same voltage can be used with the other unit, both being wired to charge a large **Edison** battery of 150 ampere hours capacity. An electric anchor winch built by **Allan Cunningham** of Seattle will be installed, also an **A. M. F.** bilge and service pump. An extra large searchlight made by **Lebby,** and a wireless outfit by **Ets-Hokin & Galvan** will be part of equipment.



Outboard profile and deck plan of tank barge, now building for the Union Oil Company of California at the Oakland yard of the Hanlon Drydock & Shipbuilding Co. This barge is designed especially for the carriage of hot asphalt. Cargo will be handled with Blackmer pumps.

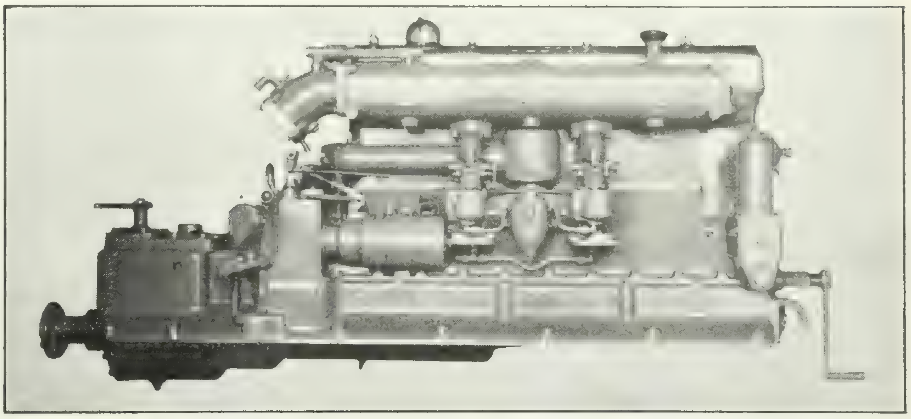
Hall-Scott Heavy Duty Marine Motors

THE refinement and improvement of the workboat engine has been going on for years. The first power units placed in these craft were crude and fussy. Sometimes they went, and then again they did not. Engineering skill and experience followed, and in time a dependable engine resulted.

Recently a representative of Pacific Marine Review made a trip to Berkeley, California, where the plant of the Hall-Scott Motor Company is located. This representative has been for many years a shop and operating engineer and believes he knows a good job when he sees one. That the product of the Hall-Scott shops is good admits of no argument. Their reputation gained in the manufacture of airplane engines is still fresh in the memory of the engineering profession. And the same care in design and precision of workmanship obtains in the workboat jobs as was put into the more romantic and highflying airplane ones. In fact, the writer was rather unfavorably impressed at first with the idea that a workboat engine should be so carefully and closely made. But a smoother running and more flexible motor has never before been seen by him in a floating craft.

Commenting on the fine workmanship of the engine, it was remarked to a Hall-Scott man that it was doubtful if it was good practice to put so much care into rough jobs. The answer to this was logical. "Nothing can be too good. If an engine is designed and built well it will hold up under the most adverse conditions. It will run with the minimum of attention and will get all the power out of the fuel fed it. While the ordinary 'gas skinner' might wreck an engine built with such exactness, it will be better to educate the operators to handle fine engines than it will be to plug along with rough and crude machines. The savings in operating costs will be more than met; repairs are reduced to a minimum; and the constant and steady running of a workboat is what pays."

And the speaker was right. This extra care in building will bring the reward. Instance, the engines of any of the high class automobiles. They will run for years without skilled attention, while the cheaper kinds soon run down and are eternally requiring repairs.


Intake side of the 100-horsepower, 6-cylinder Hall-Scott marine type motor fitted with Hall-Scott reduction gear.

While the diesel engine will keep to the front as a heavy worker, delivering power day after day at minimum cost, there are many places where the more flexible and lighter gas engine must be used, and it is for just such places that the Hall-Scott engine fits in. And to meet the situation, the company is building various powers of these units. In order that the high efficiency of the fast running gas engine may be utilized properly on the slower moving propeller of the workboat, reduction gears have been introduced whereby 2 to 1 or 3 to 1 reductions can be made. The same careful design and beautiful workmanship that characterizes the engine has been put into these gears. They are an integral part of the engine. The writer observed one of the latest new workboat engines delivering 100 brake horsepower without the slightest grinding of the gears, and she had not run more than half an hour at the time. The noiselessness of the reduction gears was remarkable and shows that great care must have been taken in the making.

In the Hall-Scott heavy duty work boat engines all cylinder bores and strokes are the same. Also the same piston and rod is used in the different sizes. Greater power is given by adding cylinders to the job. That this is an advantage is obvious. That it has been done before is also true, but never with more care than with the jobs in question.

The company also builds other engines of different bores and strokes, which are used in truck

(Continued on Page 15, Advertising Section.)

The shoal draft towboat A. E. Golvey of the Pacific Spruce Corporation powered with a Type H. S. R-6 Hall Scott marine engine.

Auxiliaries—Ship Supplies—Marine Equipment

Complete Auxiliary Power Plant

THERE has just been placed on the market the latest model of the Bromfield Twentieth Century Diesel-Diehl auxiliary power plant (patents pending) supplying air, water, electric light, and electric power for marine service by the Bromfield Twentieth Century Manufacturing Company, of Boston. This power plant is the result of a number of years of experimenting and testing both at the factory of the company at South Boston and in actual sea service. The problem of consolidating in one complete set a number of separate power units has been successfully accomplished. The plant is not only compact, the steel base occupies a space 71 by 32 inches, but the units are accessible and easy to operate with many unnecessary parts eliminated. The entire outfit is exceptionally strong and rigid, and is proof against disorders caused by vibrations.

The Bromfield plant has many advantages over the use of separate units, particularly in being less complicated and having only one source of power driving all units.

Not the least important feature of the Bromfield plant is the simplicity of operation of these three essential units. The diesel engine, cold starting, 4-cycle type, supplies power to the Diehl generator, which in turn supplies light and power current; the air compressor supplies air for the main engine. Since most diesel engines are of the direct-connected reversible type, a supply of air is needed that far exceeds the actual amount available from the main pump. A large auxiliary air compressor is incorporated in the Bromfield plant, providing the means of overcoming this condition and producing a reserve supply of air sufficient to meet all requirements. Air is obtained, immediately, in the Bromfield Diesel-Diehl set by throwing the lever. Heretofore the engineer had to prime and crank the gasoline engine several times before it would start.

The third unit of the Bromfield Diesel-Diehl plant is a large centrifugal pump with an 83 gallons a minute capacity which is connected to the bilge and sea cock. This is also controlled by the lever.

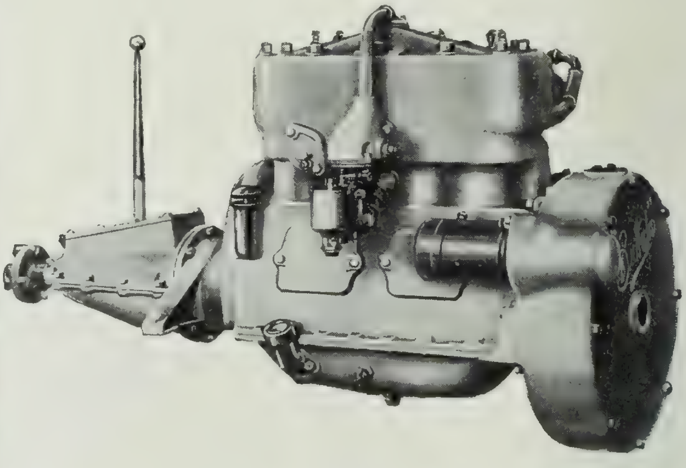
The air compressor and water pump are operated by a two-way easily operated clutch held on a ball-bearing shaft which extends through the generator. Throwing the clutch forward engages the air compressor and pulling it back engages the water pump. The clutch when in the center position is neutral.

The severe strain on the clutch when the air compressor pumps at a high pressure has been eliminated in the Bromfield Diesel-Diehl power plant. The clutch has been designed so that there is a friction contact when it is engaged part way, and when the lever is forced a little more, dogs are engaged making a solid connection, thereby eliminating any possible slipping.

Bromfield's Twentieth Century Diesel-Diehl power plants have been used successfully for a number of years aboard large fishing schooners, tug boats, and private yachts. The plant has been constantly improved so that today it represents the last word in auxiliary power plant construction.

Among the more prominent installations are the fishing schooners Gosson, Dawn, Shamrock (American entry in international fishing schooner race), and Adventure, private schooner Roseway, and beam trawler Mariner.

The Bromfield Twentieth-Century Diesel-Diehl generator complete auxiliary power plant.



BUFFALO MARINE GAS ENGINE

Our illustration shows a 4-cylinder, heavy duty, marine type Buffalo gas engine with a built in automobile type gear shift forming a popular power plant for cruisers and light towing launches. This power plant is built by the Buffalo Gas Engine Company, who are represented in San Francisco by Albert W. Lawson. Mr. Lawson has had years of experience in marine engineering and naval architecture, and this experience is now available for power boat owners.

Refrigeration For Fishing Boats

Refrigerating coils mounted between deck machines in fish holds of halibut schooner Attu.

THE fishing industry on the Pacific Coast has been growing rapidly during the past decade and is now firmly established as a big business. This is indicated very emphatically by the increasing tendency on the part of practical fishermen and the executives of fish companies to call in engineering talent for the solution of their operating difficulties. One large problem is the handling of fresh fish from the fishing grounds at sea to the receiving dock on shore, a problem that registers increasing pressure as the boats seek catches farther out, and this is notably the case with halibut fishing in northern and tuna fishing in southern waters.

Ice alone has been a somewhat unsatisfactory solution of this problem on account of its weight and its shrinkage. Ice in combination with scientific insulation and automatic refrigeration machinery now offers an ideal solution.

Two halibut boats, the Attu and President, operating out of Seattle, were equipped during the past winter with properly insulated fish holds and with Lipman self-contained refrigerating machines by the Power Plant Engineering Company of Seattle. Since these vessels are typically Pacific offshore fishing boats, a description of the refrigeration arrangements should be of interest.

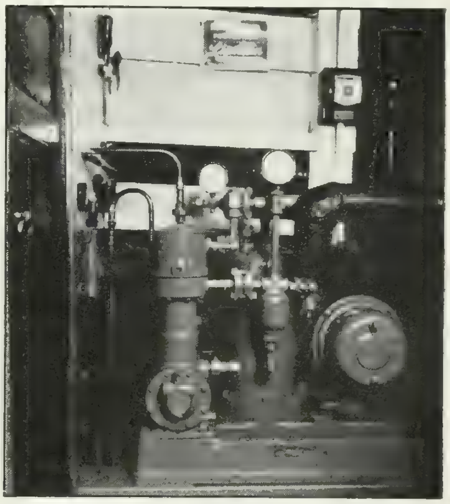
The installations are practically the same, except for capacity, that on the Attu being the larger. This vessel is of 37 tons net register, with a fish capacity of thirty tons.

A Lipman Model 100 self-contained refrigeration machine was installed in the after end of the engine room, just behind the companion ladder, where it occupies a deck space 24 by 39 inches with a height of about 40 inches. On the Attu, this model is driven by a 32-volt, 1-horsepower motor taking current from the boat's electric circuit.

The Attu is unusually well provided with electric power. A Fairbanks-Morse 32-volt, 4½-kilowatt generator, driven from the flywheel of the main engine is hooked up with a 6-tray, 250-ampere hour Edison Iron Clad battery. This battery has capacity to run the refrigerating machine motor ten hours at full load without the generator. A further stand-by is provided by the installation of a 4-horsepower Atlas-Imperial gas engine generating set arranged to recharge the battery when the main unit is not operating.

The refrigerating coils in the fish holds are carried between the deck beams and held in place by iron straps. About 370 feet of extra heavy steel tubing is used in these coils, which are welded in one piece. Special care in bending and welding was exercised on the job, with the result that a test with 250 pounds of air developed no leak in the system.

Eighteen pounds of anhydrous ammonia was needed for the initial charge of the system, and it is expected that this will last for several years and that operation cost will be limited to the power necessary to drive the machine.



Lipman Model 100 motor-driven self-contained refrigerator machine installed in engine room of motor schooner Attu.

The principal function of this refrigeration unit is not to chill or freeze the fish, but to keep the ice from too rapid melting. No thermometers have yet been installed. The operator judges the effectiveness of the refrigeration system by the condition of the ice. Efficiency will soon demand thermometers and these will undoubtedly be installed. The installation of these units is expected to cut the quantity of ice necessary by fully thirty per cent.

The entire unit can easily be made fully automatic. As installed,

(Continued on Page 17, Advertising Section.)

Halibut schooner Attu of Seattle.

An Efficient Bearing for Hard Service

THE Willamette Iron and Steel Works at Portland, Oregon, after several years of experimental work, has developed and is installing a new type of bearing for special services on industrial and marine shafting.

This bearing is designed after the best orthodox practice for the highest type of bearing service, its unique and patented feature consisting of a method by which the action of the shaft journal itself pumps a constant supply of lubricant from the oil compartment in the base of the bearing block or frame. Small holes are bored through the lining of the bearing and are countersunk at the bearing surface. The revolving journal passing the countersunk orifices creates a suction which draws oil from the reservoir through suitable passages. It has been found that the greater the pressure on the bearing, the more oil is pumped; so that the journal is working on a constantly maintained oil film. If the direction of rotation is reversed, the direction of oil flow is also automatically reversed. Thus the oil is always applied with maximum effectiveness and the oil film maintained uniformly over the entire bearing surface. This condition results in a bearing that operates with minimum friction and with maximum useful life.

In a large number of installations in the Pacific Northwest, these bearings have been in hard daily use for a number of years without showing any appreciable wear. Bearings on machine tools in the shops of the Willamette Iron and Steel Works which formerly had to be renewed every few months have, with the new system, been in operation for years with no renewal necessary. The same experience is had in bearings on calender rolls in paper mills, a service which is notoriously hard on the orthodox type of bearing.

The following letter from the Shaver Transportation Co., Portland, illustrates the service which is being obtained from Jones-Willamette bearings on shipboard:

"We have had several inquiries as to the services our Jones-Willamette bearings are giving us on the motorship Shaver, so I am writing at this time to congratulate you upon the work that these bearings are doing.

"We have installed two of them as spring bearings upon the main drive shafts. These shafts are six inches in diameter and about thirteen feet long. The bearings are placed about a third of the way back from the main engines and they are giving wonderful service under very hard conditions. As you know, the Shaver has a wooden hull with double tunnel stern and there is a constant vibration and working of this stern transmitted from the engines and the wheel.

"In the three months time that they have been installed we have not had a particle of trouble with them in any respect and we believe that this is a recommendation for any bearing.

"We also have 2-inch and 13/16-inch bearings on an idler pulley for the dynamo belt that drives off one main shaft. These bearings are being driven at a very high rate of speed for hours at a time, sometimes running three days straight without a stop, and they have never given any trouble either.

"We are writing you this letter in appreciation of the work these bearings are doing and also as a recommendation for anyone that desires a bearing under extraordinary conditions."

The engineering services of the Willamette Iron and Steel Works are at the command of anyone who is troubled with bearing problems, or who is faced with the installation of bearings on new work under difficult conditions.

Shell Group Insurance

ALL employes of the San Francisco branch of the Shell Company of California were informed March 15 that every man and woman who has put in three months or more of continuous service with the Shell company is insured for $500, and that this insurance will increase with each coming year till $1500 is reached. This insurance, which is entirely separate from the Shell Company's provident fund and the workmen's compensation insurance, is dated as effective from December 31, 1926, and the oil company will pay the entire cost of this additional protection to wives and families of their personnel.

In setting this notable example of recognizing the loyalty and perseverance of employes, the Shell Company has incorporated in the plan a further incentive to prudential investment on the part of the employes themselves, for it is provided that by investing about 80 cents a month each employe can get an additional thousand dollars' worth of insurance.

This liberal insurance protection, which is part of the Shell policy of giving all workers an additional stake and interest in the business, is provided without any red tape, physical examination, or age limitations whatever; and benefits have already been paid in the case of a worker who had passed the biblical three score and ten.

In its entirety the new Shell scheme of insurance is a vast undertaking, for it embraces all employes of this company in California, Oregon, Washington, Nevada, British Columbia, and Arizona, and reaches big figures in men and money.

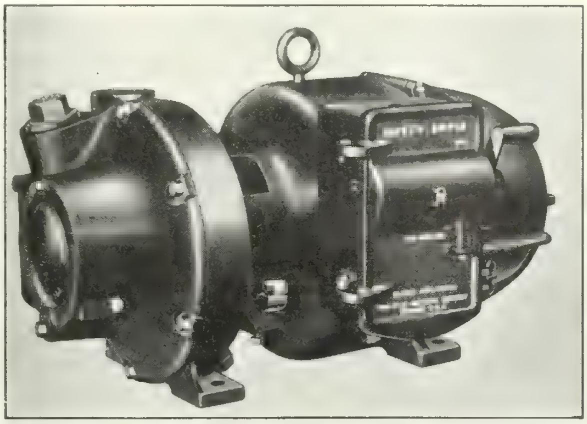
Trade Literature

American Dial Thermometers is the subject of Catalog No. 600 of the American Schaeffer and Budenberg Corporation of Brooklyn, N.Y.

This is an excellently edited booklet describing the American (formerly Reform) dial thermometer, an accurate instrument for indicating temperatures in remote or inconvenient places. There are twenty-two pages describing typical installations and the various fittings and bulbs appropriate to each. The range is from 40 degrees Fahrenheit below zero to 1000 degrees Fahrenheit, an din all ordinary installations mercury is used as an actuating medium. The bulbs are made of steel and for special applications are protected by non-corrosive shields.

The American Schaeffer and Budenberg Corporation maintains branches on the Pacific Coast with full stocks at Seattle, San Francisco, and Los Angeles. The San Francisco office is in charge of Leon S. Lyon, who will be glad to give competent technical advice to those interested in the solution of temperature indicating and recording problems.

The Pyle-National Turbo-Generating Set



Portable 2½-kilowatt self-contained steam turbine driven electric power plant manufactured by the Pyle-National Company of Chicago.

A 2½ kilowatt, heavy duty, portable, turbo-generator, which is completely self contained so that it requires no switchboards, fuse panels, or rheostats, and which has been designed to automatically maintain voltages with extreme accuracy despite wide variations of steam pressure, is a new development of the Pyle-National Company of Chicago. The new unit, which is known as type M-2-S, is suitable for use under the most adverse conditions in furnishing light or current for portable tools in oil fields, construction work, isolated stations, salvage work, power plants on tugs, yachts or workboats, or auxiliary plants on larger vessels, where generating equipment must be easily portable, extremely rugged, and yet at the same time able to deliver constant, automatically regulated current.

An automatic regulating mechanism maintains uniform voltage under extreme fluctuations of steam pressure or load. This new control will hold voltages constant to within three volts of normal—under steam pressure variation from 80 pounds to 200 pounds. If it is necessary to operate on steam pressures outside of this range a slight adjustment makes the range of regulation available over practically any group of pressures. The new regulating mechanism also affords a distinct economy in steam consumption. Racing or wastage of steam under light loads and fluctuating demands is avoided.

The design of the turbine and generator follows closely the principles which have been developed by the Pyle-National Company on their turbo-generators which have for the past twenty-five years been the almost universally accepted unit for locomotive headlight and train lighting units on a majority of the railroads. Heavy duty ball bearings and large capacity oil chambers enable the unit to run for months at a time without attention. At the same time it is completely accessible in every detail for cleaning and inspection. Careful attention has been given to waterproofing and weatherproofing so that dirt and moisture will not interfere with operation.

Another new feature is the mounting of an enclosed fuse panel and safety switch box as an integral part of the unit in place of the usual terminal box. This makes the unit complete in itself and avoids the necessity for additional wiring, fuse, and switch arrangement when the unit is installed. With this rugged, completely self-contained unit all that is necessary is to attach the steam line and the supply wires and the plant is ready for operation. The unit has been carefully designed to stand extreme rough usage, so that there are no projecting parts which are likely to be injured or broken off in handling or moving.

Fire Protection on Small Boats

The ready and instant application of a fire extinguishing gas often saves a valuable vessel and the lives of her crew, as well as her cargo. In the larger types of vessels this system has been brought to an almost absolute perfection, but only recently has attention been directed to the need of similar methods being used on smaller craft such as workboats, cruisers, and runabouts.

Hough and Egbert, who, as Pacific Coast distributors for Walter Kidde & Company of New York, installed the Lux fire extinguishing system on the big tanker Lio, have recently made exactly similar installations on several small craft plying on San Francisco Bay and its tributary rivers. The fast gasboat Ajax, operated by the Board of State Harbor Commissioners, and the Hoqua, a Stephens' cruiser owned by Mr. Mills of San Francisco, each have one 50-pound flask of Lux carbon dioxide installed and so piped that special streams can be thrown on the carburetors and crank cases of the engines if needed. Tests of these have proved that no fire, even of gasoline, can exist when the Lux CO_2 hits it.

Methods of operation have been developed so that the man in control of the boat at the wheel and engine operating gear has the valve of the fire apparatus under his hand ready for instant use. To prevent accidental opening, the valves are protected by a glass plate, easily broken, exposing the fitting.

Full protection of all bilges and tank tops against damage by fire has been installed on the schooner yacht Northern Light, building at the yard of W. F. Stone & Son, Oakland, for John Borden of Chicago. It is extended also to the engine rooms and such other spots that might be danger points. The development of these small units of fire protection equipment should meet with favor of operators and owners of workboats and similar craft.

New Oil-Tight Paint

A PAINT which is said to be the only material that effectively seals joints against oil leaks has been developed by the General Electric Company and is sold by the Merchandise Department at Bridgeport, Connecticut. The product, known as G-E No. 880 Red Protective Paint, also prevents water and gas leaks. It can be used for many purposes which require red lead or white lead, and is less expensive than either.

The paint, which is dark red in color, requires no priming and can be applied by brushing or dipping. Denatured alcohol is used as a thinner. It dries rapidly and produces a hard, smooth, glossy film which is easily cleaned and which prevents excessive collection of dirt and conducting material, thereby decreasing surface leakage and subsequent carbonization of the surface when used with electrical apparatus.

One of the first fields in which the paint has been applied is in the manufacture of fuel oil burners, in which one company is now using the material to seal all joints. Other fields include plumbing, chemical plants, repair and service shops, and shipyards.

Book Reviews

The Fore and Aft Rig in America, by E. P. Morris. 215 pages, bound in blue with gold stampings; printed on special heavy paper, with numerous illustrations; a special limited edition; published by the Yale University Press. Price $4.

This sketch traces, with a great deal of scholarly thoroughness, the development of the fore and aft rig for all classes of boats in Colonial America and later in the United States. The material is presented in a very interesting manner and should be of great interest to every lover of sail boats and yachting.

The Theory and Practice of Steering, by G. F. Leechman. 96 pages, profusely illustrated; bound in red buckram with gold stampings. Published by James Brown and Son, Glasgow, Scotland.

This is the first book to be published on a very important subject. One wonders why. There is perhaps no one detail of ship operation into which the personal element enters so largely as it does into the duties of the helmsman. This book covers simply and comprehensively the elements of modern steering devices and the art of steering. It should be in the hands of all quartermasters, junior officers, and apprentices, being particularly adaptable for use by those who are instructors or those who are learning the fine points of steering, either on sailing or power driven vessels. The price is three shillings and sixpence at Glasgow.

Ship Model Making, by Captain E. Armitage McCann. Profusely illustrated and with a colored frontispiece; published by The Norman W. Henley Publishing Co., New York. Price $2.50.

Captain McCann is one of America's leading authorities on ship models. He has here produced a practical and timely book in popular style which gives specific directions so that any person handy with tools can make very worthwhile models of any of the picturesque old styles of sailing ship. The tools required to follow these directions are few and simple and the expense is very small. Complete directions are given as to the proper materials for this use and the manner in which these materials are fastened together and the technique of painting and color. Minute details of spars and rigging and fittings are covered in a very simple way and yet in complete detail, so that to produce decorative models of ships it is only necessary to follow directions.

This is said to be the only book of its kind ever published.

How to Make a Clipper Ship, by Captain E. Armitage McCann. Profusely illustrated with pen and ink sketches, scale drawings, and an excellent frontispiece. Published by the Norman W. Henley Publishing Co., New York. Price $2.50.

This volume, which is a companion book to "Ship Model Making," tells how to make a clipper ship model either of the simplified type or with complete details. The clipper ship chosen is the Sovereign of the Seas, said by all the old timers to be Donald McKay's most beautiful American clipper. Wth ample descriptions, illustrations, and full sized plans, anybody, the author tells, with a few tools can make a simplified model of this ship. This simplified model, whil eretaining the general appearance of a clipper ship eliminates a tremendous amount of work in small detail. For those who desire to make a finished job, all details are given, including the entire building of the hull, the masts, the spars, the rigging, with plans to scale from keel to truck and from bowsprit to gudgeon.

Either of the above books may be obtained through Pacific Marine Review or from the publishers.

Trade Literature

The American Engineering Company of Philadelphia, well known as one of the leading manufacturers in the United States supplying auxiliary machinery, such as windlasses, hoists, davits, winches, refrigeration machinery, steering equipment, and gypsies, has issued a very attractive booklet announcing their complete new line of popular-priced auxiliaries for yachts —"radically different from existing types and far better than anything ever before offered to the yachtsman."

W. V. A. Kemp, Rialto Building, San Francisco, Pacific Coast representative of the American Engineering Company, will be glad to send catalogs to anyone interested in asking for them.

We have received from **Burmeister & Wain, Ltd.,** of Copenhagen, Denmark, a very beautifully printed book of 67 pages describing their shipyard in the year 1927. The book is made up for the most part of full page half-tone reproductions of photographs of the most famous of the motorships turned out of the plant of this organization, together with plans of many of the vessels showing general construction and machinery arrangements. A brief description of the shipyard and engine shops of Burmeister and Wain is also given with maps showing their location in the harbor of Copenhagen.

American Brown Boveri Electric Corporation, with plant at Camden, New Jersey, and sales office at 165 Broadway, New York, has issued descriptive catalog No. 100 covering **Steam Turbo-Generators.** This is a very attractively made up catalog of 47 pages, printed on very fine coated paper, with numerous halftone illustrations and line cuts of drawings.

The catalog outlines briefly the distinguishing features of the American Brown Boveri steam turbines, and the book, which is called a descriptive circular, describes the operation and construction of normal steam turbines and generators as combined in one unit and also outlines and illustrates some of the special purposes for which Brown Boveri turbines have been developed and the type of service which they are rendering.

Past & Present is the title given to a book recently received from the **Osaka Shosen Kaisha** (Osaka Mercantile Steamship Co., Ltd.), of Osaka, Japan, covering the history and present activities of the company in the merchant shipping business. The company, "equipped with a capital of 100,000,000 yen and a fleet of over 443,000 tons gross, is now conducting 55 regular services." The history of the development of this company, established in 1844, is very interestingly written. It is neatly printed, of 40 pages, bound in white, and contains full details of the firm's financial and business standing, including lists of securities and other assets, and maps and charts of freights, revenues, and other data. Williams, Dimond & Co. are San Francisco agents.

The San Francisco Convention & Tourist League has been organized by a number of representative citizens of San Francisco for the purpose of securing conventions and tourists, and particularly for the purpose of enabling such prospective visitors to secure all the information they desire for the purpose of making up their itinerary and convention plans. An interesting folder has recently been published entitled "San Francisco" listing the leading hotels and the principal points of interest in San Francisco and vicinity.

New Sales Manager for American Engineering

THE appointment of Joseph G. Worker as general sales manager and his election to the board of directors is announced by the American Engineering Company of Philadelphia as the beginning of extensive plans for marketing their many and varied products, including the Taylor stoker, Lo-Hed electric hoists, Juruick commercial refrigeration units for restaurants, hotels and clubs, and the A-E-CO line of fine yacht and ship auxiliaries and cargo-handling machinery.

Mr. Worker assumes his new duties with more than twenty years' experience in engineering and sales work and an intimate knowledge of the products and policies of the American Engineering Company, acquired during the past five years as assistant to the president. A graduate of the University of Illinois with the degree of B.S. in Mechanical Engineering, he is a member of the American Society of Mechanical Engineers, a former president of the Stoker Manufacturers' Association, and is widely known as a writer of articles on combustion engineering and co-author of a work on Mechanical Stokers.

For fifteen years, Mr. Worker was associated with the Westinghouse companies and for the last five years of this period was manager of the Stoker Section of the Westinghouse Electric and Manufacturing Company at East Pittsburgh.

C. V. Lane Successor to Ford and Geirrine

IT is obvious that a salesman or agent for machinery of any sort will be a better man for the place if he thoroughly understands the detail work of building such machinery. And if, in addition to this advantage, he is also a designer and builder his value is even greater. Such a one is C. V. Lane, who, after over five years with the consulting engineering and specialty firm of Ford and Geirrine, San Francisco, has taken over the business, which he will carry on under his own name.

Mr. Lane came to California as a child, and has absorbed the full California spirit. When a lad he commenced work at the old Union Iron Works, where he rose from apprentice to assistant to the chief engineer, mainly specializing in marine work. While doing this he was on board steamers making trial trips for several hundred of these events. It may well be called an event when a powerful steamer make her first trial trip, as those who have been in the game know, and it is creditable to Mr. Lane that after all these exacting runs he has the record of never falling down on one. Three years' service in the machine and erecting shops at a time when big engines and auxiliaries for battleships and cruisers were being built afforded an opportunity for gaining a knowledge of every practical detail of the design and manufacture of such machinery.

Thirty-one years ago Mr. Lane, with six boys from the Union Iron Works drafting rooms, and under A. E. Roberts, a practical mechanical draftsman and designer, as teacher, started the Humboldt Evening Technical High School in San Francisco. This institution within thirty days had 400 enrolled, and during its useful history has greatly assisted many young men in search of knowledge as applied to practical technical problems.

During the late war, Mr. Lane was chief draftsman at the Union Plant, Bethlehem Shipbuilding Corporation, attending to much of the detail work during the program of construction of destroyers and submarines for the United States Navy, as well as the big freighters and tankers for the Shipping Board.

After the war he became associated with the firm of Ford and Geirrine with whom he was connected until he assumed full control of the business. The many years of practical manufacture, design, and construction, together with a personality which makes him friends, certainly gives Mr. Lane a splendid capacity to take care of the executive end of this business, established for many years and built up to its present proportions by the ability and attention to detail of its original sponsors.

Twenty-seven years ago, the writer of this article was one of the engineers on the trials of the battleship Wisconsin, when Mr. Lane was one of an army of oilers. Going up the coast against a heavy northwester pretty near all the engine room crew were seasick, but to show the pertinacity of Lane, he kept on the job, though probably about as ill as the balance who gave up. In fact, the writer and Lane ran the starboard engine room alone for several watches until the smooth waters of Puget Sound were entered.

Two Rhodes Specialties

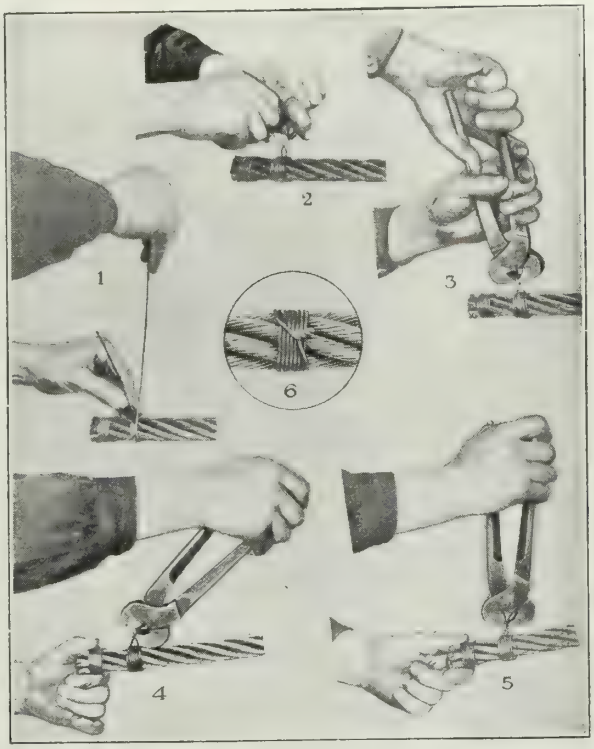
SALES of the Ray fusible plug for steam boilers are quite brisk lately. This plug is a California product and is the invention of a practical marine engineer who knows the troubles encountered in many of the old time fusible plugs. Though easily renewed and very simple in construction, these plugs are solid and sturdy. They have been approved by the United States Board of Supervising Inspectors, and have also been adopted by railway superintendents as essential equipment for boilers.

With the improved plug there is protection both for the fuse and the steel of the plates. There are no areas of metal exposed to fire action, nor are the threads touched by the flames. All threads are standard pipe sizes, and if ever it should become necessary to clean out a tapped hole, tools are always available on board. Replacement and inspection of these new plugs is a matter of a few moments work with an ordinary screwdriver. C. E. Rhodes Company of San Francisco are the distributors for the Pacific Coast.

This firm also handles an improved portable lamp named Protex. This lamp is so well insulated that it can be placed under water without fear of injury. Those of our marine engineer friends who have had nasty "kicks" from grounded portables will appreciate the Protex. Sales of this article have been brisk, and it is believed when Protex is better known it will be universally adopted by steamship men. It is admirable for deck use, around refrigeration rooms, or on tankers, as practically all danger of fires or shocks from grounds or shorts is eliminated when Protex is used.

How to Seize Wire Rope

THE end of an ordinary wire rope should have at least three seizings to prevent unlaying, which, if it occurs, would render the rope useless. The seizings may be replaced by fittings if they are designed to prevent unlaying of the rope.



1. Wind the seizing wire on the rope by hand, keeping the coil together and considerable tension on the wire, winding over from left to right as in Fig. 1 of the accompanying plate.
2. Twist the ends of the wire together counter-clockwise by hand so that the twisted portion of the wires is near the middle of the seizing.
3. Using Carew cutters, tighten the twist just enough to take up the slack. Do not try to tighten the seizing by twisting.
4. Tighten the seizing by prying the twist away from the axis of the rope with the cutters.
5. Tighten the twist again as in 3. Repeat 4 and 5 as often as is necessary to make the seizing tight and rigid. Cut off the ends of the wires, and pound the twist flat against the rope.

The appearance of the finished seizing is shown in Fig. 6.

Any annealed low carbon steel wire may be used for seizings, the size ranging from No. 10 to No. 18, depending upon the diameter of the rope. This method is taken from the United States Government Master Specifications No. 297. Photo through courtesy of American Cable Company.

Trade Literature

The **Shipping Board Merchant Fleet Corporation** is issuing a booklet entitled **"Trade Routes and Shipping Services in Relation to Commerce of the United States, and the Development of an American Merchant Marine,"** which is now available for general distribution.

"This is an important publication," said General Dalton, president of the Merchant Fleet Corporation, "especially prepared for information of the American people who are the owners of and stockholders in the Merchant Fleet of the United States Shipping Board."

A graphic description of each Shipping Board Service is given, with an outline map, a list of merchant ships in actual operation, the name and address of managing operators of each line, illustrations showing the wide scope and varying activities of the several services, together with a brief synopsis of the trade peculiar to each route.

The **Lincoln Electric Company** of Cleveland has just issued the 1927 Edition of the **Instruction Manual.** This publication, which is revised annually to cover the latest practices used in manual electric arc welding, is of interest to practically everyone who uses arc welding. Among the subjects treated are: High speed steel welding, high pressure pipe welding, automobile frames, boiler repairs, welding cast iron, manganese steel welding, carbon arc welding, manufacture of machinery and equipment using welded steel in place of castings. Price $1.00.

The Door to Economy is a very neatly designed handbook published by **Greene, Tweed & Company,** of New York, calling attention to the results of their many years of experience in the production of high grade packings for various industrial and marine uses. The book also covers, as an adjunct to economy, the Favorite reversible ratchet wrench.

Covered with a facsimile of a three-panel door, marked "Economy," and bidding the curious to "enter," this booklet leads the reader through a great variety of applications of packing with specific directions for treatment of bearings and joints. It is of handy size, and in addition to the information on bearings and wrenches, has considerable and very conveniently arranged general technical information.

Monel Metal Shafting

THE problem of corrosion and pitting in propeller shafts has always been a very troublesome one for the marine engineer. This problem is particularly difficult in tropical or semi-tropical warm salt waters.

Recent correspondence from New Orleans indicates that progressive workboat owners of the Gulf are using monel metal shafting. A letter from the Barker Barge Line of Lockport, Louisiana, advises that they have been using monel metal propeller shafts on their motorboats for "some sixteen years with entire satisfaction." The Barker Barge Line operates the Lockport Welding and Machine Works, and during the period mentioned above they have made installations not only on their own motor tugs, but on the boats of many of their customers, particularly on fishing boats using shafts from 7/8 inch to 2½ inches in diameter.

The letter states that they now have "a great many customers who will have nothing but monel metal for a propeller shaft. Every installation is in boats that navigate in salt water the year round, and they have no trouble with their shafts pitting. We can recommend monel metal shafting for everything that the manufacturers claim for it. The reason we are using it is because we obtain the best results." The Barker Barge Line owns a speed boat with a monel metal hull which has been in use in salt water for some fifteen years, and is still in excellent condition.

Marine Insurance

Edited by JAMES A. QUINBY

Tug and Tow — A Composite Identity?

OUR federal courts have long experienced difficulty in deciding, under certain conditions, whether a tug and tow, owned by the same owner and operated as a single unit, shall be treated as one vessel or two. In such a situation, does Section 3 of the Harter Act apply, and does the so-called "Limitation of Liability" statute (R. S. 4283) apply? In both these statutes the term "any vessel" appears, and judicial interpretation affecting a towage contract becomes very important, not only to the owners of vessels and cargo, but to their insurers, and more particularly to insurers covering tower's liability and P. and I. risks.

THE CAPTAIN'S CABIN

He paced the good "Narenta's" bridge, a sea-dog through and through,
The master of as fine a ship as ever rode the blue—
He told me this himself, and so of course it must be true.

I liked his weatherbeaten cheek, the twinkle of his eye,
He was a bluff-bowed human craft, a sailin' full and bye—
A stern and hardy man withal, at one with sea and sky.

But in the master's cabin was naught of wind or sea,
Nor boarding pikes nor cutlasses to quell a mutiny—
But earthen pot and window box bore flowers fair to see.

It pleases me to think of him as last I saw him—so—
A doughty figure on his bridge—yet shipmate, down below—
With hyacinth and daffodil and freesias in a row.

And thus, amid storm-ridden years,
I pray, dear God, to find
A bit of scented color
In the cabin of my mind.

J. A. Q.

Prior to 1919, the Sixth Circuit and the Ninth (Pacific Coast) Circuit consistently held that the employment of a barge without motive power necessarily implied a contract to tow, and that therefore, to all practical intents and purposes, the tug and tow were one. It was accordingly held that in order to limit liability in a towage case, both vessels must be surrendered by the common owner.

The Liverpool Case

In 1919, however, the Supreme Court, in the case of Liverpool Navigation Co. v. Brooklyn Terminal, 251 U. S. 48, apparently rejected this rule, and it has remained for the case of Sacramento Navigation Co. v. Salz, recently decided by the same tribunal, to cast doubts on the thoroughness of the rejection.

The Salz decision involved the attempt of a cargo owner to deny the protection of Sec. 3 of the Harter Act to the Sacramento Navigation Co. on the ground that two separate vessels were involved in the towage. In September, 1921, a steam tug and barge, both belonging to the navigation company, collided with a British ship at anchor, and the entire cargo of the barge was lost. The accident was due to the negligence of the two.

In both the District Court and the Circuit Court of Appeals the cargo owner prevailed, but the Supreme Court reversed these decisions and held, in favor of the shipowner, that the tug and tow constituted a single entity.

"Considering the language of the bill of lading in the light of all the circumstances, it is manifest that we are dealing with a single contract and the use of the tug must be read into that contract as an indispensable factor in the performance of its obligations. To transport means to convey or carry from one place to another; and a transportation contract for the barge without the tug would have been as futile as a contract for the use of a freight car without a locomotive. In this view, by the terms of the contract of affreightment, in part expressed and in part necessarily resulting from that which was expressed, the transportation of the goods was called for not by the barge, an inert thing, but by the barge and tug, constituting together the effective instrumentality to that end.

"In The Northern Belle, supra, this court, speaking of a combination of barge and steamboat, said that, 'The barge is considered as belonging to the boat to which she is attached for the purpose of that voyage.' In the Civilta and the Restless, supra, a tug and a ship which she was towing by means of a hawser were held to be in contemplation of law 'one vessel, and that a vessel under steam.'

"In The Columbia, supra, it was held that a barge having no motive power and a tug belonging to the same owner and furnishing the motive power constituted one vessel for the purpose of the voyage. In that case, wheat was to be transported by means of the barge, and the owner of the barge and tug undertook the transportation. The court said (p.237): 'As the wheat was to be carried on board the barge, which had no motive power, of necessity such power had to be supplied by the carrier. . . . When the tug made fast and took in tow the barge, to perform the contract of carriage, the two became one vessel for the purpose of that voy-

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age,—as much so as if she had been taken bodily on board the tug, instead of being made fast thereto by means of lines.' It was, accordingly, held that, without surrendering both vessels, the owner was not entitled to the advantages of Revised Statutes 4283 et seq., providing for a limitation of liability of 'the owner of any vessel,' etc.

"Respondent contends that his view is sustained by The Murrell, 195 Fed. 483, affirming 200 Fed. 826, and The Coastwise, 233 Fed. 1, affirming 230 Fed. 505. Some things are said in those cases which, if we should not consider the differences between them and the present case, might justify this contention. The most important of these differences is that in both cases it was held that contracts of towage and not of affreightment were involved. We do not stop to inquire whether this conclusion as to the nature of the contracts was justified by the facts. It is enough that it was so held and this holding was the basis of the decisions. Here, upon all the facts, as we have just said, the contract upon which respondent must rest is one of affreightment, the obligation of which is to carry a cargo, not to tow a vessel.

Liverpool Case Distinguished

"Liverpool, &c. Nav. Co. v. Brooklyn Term '1, 251 U.S. 48, also relied upon by respondent, is not to the contrary. There the libel was for a collision with petitioner's steamship, the moving cause of which was respondent's steam tug, proceeding up the East River, with a loaded carfloat lashed to one side and a disabled tug to the other, all belonging to respondent. The carfloat came into contact with the steamship; but the court said it was a passive instrument in the hands of the tug and did not affect the question of responsibility. The controversy arose upon a claim to limit liability, petitioner contending that the entire flotilla should have been surrendered. This court held that it was necessary to surrender only the active tug, saying 'that for the purposes of liability the passive instrument of the harm does not become one with the actively responsible vessel by being attached to it.' But this is far from saying that the entire flotilla might not be regarded as one vessel for the purposes of the undertaking in which the common owner was engaged at the time of the collision. The distinction seems plain. There the libel was for an injury to a ship in no way related to the flotilla. It was a pure tort—no contractual obligations were involved; and the simple inquiry was, What constituted the 'offending vessel?' Here we must ask, What constituted the vessel by which the contract of transportation was to be effected?—a very different question. If the British ship which here was struck by the barge were suing to recover damages and a limitation of liability were sought by the owner of the tug and barge, the Liverpool case would be in point. But the present libel is for a loss of cargo and falls within the principle of the Columbia, supra, where, upon facts substantially identical with those here, a surrender was required of the combined means by which the company undertook the transportation of the cargo."

Decree reversed.

Fearless Journalism

IN BROWSING over the Coast Review for July, 1877, we find the following echo from a hard-fisted past, when double-action compliments flew to and fro on California Street. Just notice, if you please, that it is the underwriter who is accused of oppressing the poor downtrodden broker.

Mr. Jones, Insurance Manager of Falkner Bell and Co.

"Were the underwriting abilities of this individual in the direct ratio of his insolence and vulgarity, the Imperial and the Queen would have lost the services of an efficient officer by the recent change that has been effected in their Pacific Coast agency. It may be admitted, however, on a careful survey of that person's professional antecedents, that the transfer is likely to prove advantageous to all the parties in interest.

"The genius of Jones is eminently Peter Funkian and would shine more brilliantly amid the strategies of a cheap auction store than in representing the interests of an insurance company. His mind, so to speak, is essentially of the retail order, and why he should have been permitted to occupy a position requiring large and liberal conceptions, is one of those perversities of destiny that can never be explained.

"It is true that for bulldosing a broker and bilking him of his commission, Jones has shown an ingenuity of resource almost unrivalled, but such a practice inures perhaps not at all to the pecuniary profit of his principals, and certainly detracts from their respectable reputation. Our charge against Jones, which we make on information and belief, is that he throws off the brokers who bring business to his companies and patters round among their customers in order to obtain risks directly.

"According to our conception, Mr. Jones is a type of the underbred, bouncing Briton, whom the ridicule of such papers as the London "Punch" is trying to imbue with a decent regard for the feelings of others. Under this process the type is refining away, and probably in time will become extinct, or Mr. Jones will be

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left lingering as a solitary specimen. In the latter case, we recommend that he should be secured in a museum as a study for the natural historian or the moral anatomist."

Admiralty Jurisdiction Limited

THE Circuit Court of Appeals for the Ninth Circuit recently handed down an important and somewhat novel decision in the case of the N. Y. K. Line against the Great Western Power Company.

It has always been conceded that federal courts of admiralty had jurisdiction over cases involving injury or damage to vessels on navigable waters. The present decision holds that the admiralty jurisdiction does not extend to damages suffered by fixed structures, even though such damages are caused by vessels afloat.

In October, 1917, an N. Y. K. boat, at anchor in the harbor of San Francisco, dragged her anchor across the Great Western cable near Pier 18, damaging the cable severely. The Great Western brought an action in personam and recovered in the District Court, it being clearly shown that the vessel was negligent.

The reasoning of the court is set forth in the following extract from the opinion.

Asserting the familiar rule of American maritime law that torts to be marine must be consummate upon water, appellant declares that a power cable, having its attachments on shore, and being used wholly in aid of land commerce and business is not a marine structure and has not the smallest relation to navigation. The cable of appellee was attached to shore fixtures before it entered the bay on the one side and as soon as it left it on the other. It was not an aid to navigation nor connected with shipping or water-borne commerce in any way. The injury was caused to it as it lay in the field and path of navigation, where it had permission to be. It was both placed and injured in the marine element. And so the locus of the tort was properly claimed, provided the cable was not so connected with the shore as to give its submerged length character as a commercial utensil having to do wholly with business on the land.

That there is no reciprocal remedy in admiralty in favor of a land structure against a ship for damage committed by the latter is affirmed in the American admiralty law—notwithstanding that the ship may always claim her damage in the court of her domain for injury done to her by the former. The Plymouth, 3 Wall. 20, is the leading case.

English Rule Distinguished

There a fire was communicated by a ship to a wharf and as the wharf was a land structure it was held no tort consummate upon water was proved, and admiralty jurisdiction was denied. This case drew a sharp line of differentiation between the American doctrine and the English Admiralty Act (24 Vict. Sec. 7), which allowed cognizance of any claim for damages done by a ship in navigable waters. It established the law definitely that a land structure, whether used in connection with ship commerce or not, provided no maritime locus to support a tort libel, the attachment to the land seeming to be the determining factor. With the law so established the case of the Blackheath, 195 U. S. 361 (a libel for damage done by a ship to a beacon used to warn shipping and foundationed upon a point of land) arose. The court sustained admiralty jurisdiction, but particularly declared that in making its ruling there was not encountered "The Plymouth or any other authority binding upon the Court." In the Blackheath the court reasoned that the beacon was a government aid to navigation, fastened to a point which was **only technically land,** injured by the motion of a vessel beginning and consummated upon navigable water. Justice Brown in concurring in the decision stated that as he considered it, the case overruled former cases and recognized the principle of the English admiralty law extending maritime remedies to all injuries comimtted by a ship.

Bridge Cases

Following this case came the Cleveland Terminal and Valley Railroad Company vs. Cleveland Steamship Company, 208 U. S. 316, where a ship had injured a pier of a swinging drawbridge spanning a navigable river. The court held there was no jurisdiction in admiralty in favor of the bridge owner. And the Chief Justice, referring to The Blackheath, and to Justice Brown's interpretation of its effect, stated that the law of The Plymouth was not overruled thereby. Again, in Martin vs. West, 222 U. S. 191, a case where a ship collided with a span of a toll bridge, the test of locality of the tort was not answered, the court declared, so as to give admiralty jurisdiction. The Raithmoor, 241 U. S. 166, applied the Blackheath decision to facts similar to those shown in the latter case—the injury by this ship being to an uncompleted beacon being erected by the government—but extended the doctrine of locality not at all beyond the special conditions there present.

There is to be noted also, a case decided by the District Court of the Southern District of New York, the decision being later affirmed by the Supreme Court without opinion: The Poughkeepsie, 162 Fed. 494; 212 U. S. 555. There, wrought iron pipe, extending above the surface of the river, and being used to make bor-

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ings in the bed thereof as a part of the process of constructing a water conduit under the river, was injured by steamers. The protruding pipe was completely surrounded by navigable water. In ruling against admiralty jurisdiction District Judge Adams said:

"The project which libelant was engaged in is not even suggestive of maritime affairs, nor was it in any sense an aid to navigation which was the distinguishing feature in The Blackheath."

Rule as to Telegraph Cables

No case involving damage to cables where an admiralty remedy was claimed, so far as we are advised, has yet reached the Supreme Court. At least three such cases have been decided in the District Courts and admiralty jurisdiction was sustained on claims made by the owners of the cables. They were all cables used for the purpose of transmitting telegraph messages. See U. S. vs. North German Lloyd (D. C. So. Dist. N. Y.) 239 Fed. 587; The Toledo (D. C. N. J.) 242 Fed. 168; Postal Telegraph Cable Co. vs. P. Sanford Ross (D. C. So. Dist. N. Y.) 221 Fed. 105. The judges deciding these cases epitomized their reasoning and conclusions as follows:

> Judge Manton, in 239 Fed.: "Since the injuries had to do with the operations of navigation, and the cable itself was connected with the subject of navigation when occupying some portion of the navigable channel, and was not a structure on land nor affixed thereto as a part thereof, I am of the opinion that admiralty has jurisdiction."
>
> Judge Davis, in the District Court of New Jersey, in the Toledo said: "When a vessel on the high seas or navigable waters of the United States commits a tort by negligently injuring a cable, the contention that the cable was lying on the bottom of the river or sea and ultimately reached the land, and therefore admiralty does not have jurisdiction, ought not to prevail, when all of the other elements necessary to constitute a marine tort are present."
>
> And Judge Chatfield in the Eastern district of New York in the Postal Telegraph cable case said: "But the court is of the opinion that a submarine cable of this sort is not a **structure on the land and affixed thereto** as an extension of the shore, even though connected therewith as an aid to land commerce. It is therefore subject to maritime control."

To summarize: The Constitution gives to the Federal Courts such admiralty and maritime jurisdiction as was known and understood in the United States when the Constitution was adopted; not limited to tidal waters (The Genessee Chief, 12 How. 443) as restricted by the English Courts; nor extended so as to cover every claim for damage done by a ship, as is provided in the English Statute (The Raithmoor, supra).

In the decisions in the telegraph-cable cases, where the judges say that the cable is "connected with the subject of navigation," that expression can mean no more than that the cable is established in navigable water; unless the assumption is indulged that such cable has some use in navigation by the transmission of messages therethrough to direct the course and movement of vessels. No such use can follow as an incident to the purpose of the power cable.

A power company engaged in conveying electrical energy for great distances, as is common nowadays, may find that it can save land equipment and expense by aiding insulation and dropping its lines to the beds of navigable rivers wherever it is desired to cross them. If the decisions in the telegraph-cable cases are applicable, the lines under water become detached from the land structures and take character as a segment distinct from the rest of the physical system;—a legal amphibian, truly. It would seem that such a segment cannot be thus separately defined, without support from the very criterion—that every injury committed by a ship is compensable in admiralty—which the Supreme Court of the United States has said is no part of American maritime law.

Perhaps in the expanding scope of the industries, and the adoption of new methods and means for the

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transmission of power, with utilization of sea, river, and lake beds as supports for conduits and conveyances, it will be thought that a condition of business necessity exists as will justify the further extension of the admiralty jurisdiction. And perhaps the present case furnishes facts favorable to such an extension. In our view, however, to so declare the law to be is to mark a step beyond the admiralty field as we understand it to have been thus far established by the decisions of the Supreme Court.

The second and remaining point made by appellant, that under the express terms of the permit issued by the War Department and under which the power cables were laid, the permittee waived all right to claim damages for injuries to its cables caused by the anchors of ships, it is not necessary to consider in view of the conclusion announced on the question of jurisdiction.

The decree is reversed with direction to the District Court to dismiss the libel for want of jurisdiction. Appellant to recover its costs.

Rubber Lumber

THE B. F. Goodrich Rubber Company comes to the front with another rubber development of outstanding character. A short time ago an announcement was released by them telling of the discovery and development of Vulcalock—a cement-like mixture which causes rubber to stick to metal or wood. And now Goodrich research engineers are converting rubber into lumber.

This new product, which has been called Aeroboard, has been used experimentally in the construction of a few speed boats, pontoons, and airplane fuselages. In all such tests it has shown results surpassing wood. Goodrich engineers' reports indicate that the new material can be worked practically the same as wood and in many cases can be worked into difficult rounded or curved shapes much easier than wood. It can be attached to frames with nails or screws without danger of splitting.

Due to the softening characteristics of rubber when heated this material can be molded to difficult shapes when heated to the temperature of boiling water and retains such shape when it is cooled without destruction of any of the original tensile strength of the board.

Rubber has a natural flexibility and the retention of much of this quality in Aeroboard, Goodrich engineers claim, will prove of incalculable benefit in fuselage construction. The stresses set up in an airplane fuselage when landing are more likely to be absorbed and their destructive strains checked or eliminated when the body is of rubber lumber.

In the report of the Goodrich engineers is found evidence of the new material's strength. Tests conducted showed that the rubber lumber withstood strains of great force. In practically all cases the resistance to breakage force was equal to wood of the same thickness and under some conditions the rubber lumber showed itself to be from two to five times stronger than wood.

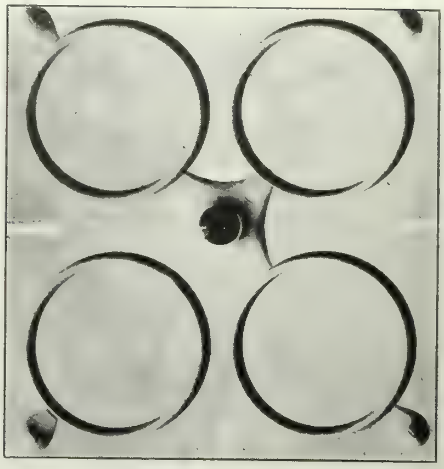
It possesses a very low moisture absorption quality which naturally recmmends the material for light boat construction. Laboratory experiments established the fact that the new material would absorb less than one per cent of moisture when immersed in water maintained at a temperature of 70 degrees Fahrenheit for seven weeks.

Rubber naturally resists the corrosive action of sea water, barnacle growths do not attach themselves to it as easily as to wood, and for all practical purposes it has a longer life than wood when exposed to such elements. This latter fact is established by the nature of the material and the manner in which it is vulcanized.

The new material is not being produced in commercial quantities at the present time, but the Goodrich company is planning on such production at an early date.

Hammered Iron Piston Rings

MANY eastern manufacturers are using the American Hammered Iron Piston Ring Company's products for gas, diesel, steam, and compressor pistons. It is claimed that these have advantages over the common cast iron rings.



Group of four rings in mold.

The basic feature of these rings is that they are all individually cast. Small sizes are cast in groups, as shown in the illustration, while larger sizes are cast singly. Running the liquid metal as shown, flowing from the bottom of the mold and rising to fill, floats off all impurities and slag and tends to produce a denser and more uniform grade of cast iron. After these rings are roughed out they are cut for lap joints. Then they are run through a special machine which automatically peens the inner ring surface. This is claimed to impart a tension which will remain for long periods without losing elasticity. The automatic method of producing this peening is covered by basic patents.

Finished casting for a hammered iron piston ring.

After having been peened, the rings are electrically chucked with the ring closed and turned and finished outside to the predetermined diameter. Another automatic machine mills the sides and finally grinds the edges to an exceedingly fine finish, the resulting job being well nigh perfect mechanically.

It is said that these rings, being of a single piece and simple to handle, give excellent results and are very easy to install. They are also concentric in form, the manufacturers believing this to be the proper way to make piston rings.

E. V. Winter, who is distributing these rings on the Pacific Coast, is himself a practical engineer and gives personal attention to all installations. This gentleman says that for diesel engine pistons, there is nothing to excel them, as their proper hardness (200 to 230 Brinnel) insures lasting wear, while their 30,000 pounds tensile strength lessens breakage. Automobile engine manufacturers are using these rings extensively and recently several sets have been placed in the ammonia compressors of a Coast steamer where they are doing excellent work.

American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Shipbuilding Work in Prospect

TWO RIVER BOATS PLANNED

Announcement has been made by Emmett Rathbun, manager of the Harkins Transportation Company, Astoria, Oregon, that the concern is planning the construction of two large freight and passenger boats to supplant the Undine and Lurline on the run between Astoria and Portland.

According to Mr. Rathbun the new craft will be 180 feet long, 31-foot beam, and 7½ feet draft. They will be powered with diesel engines and will be considerably faster than the present craft.

Each boat is to have ten de luxe rooms with beds. In addition there will be 18 cabins with two berths each, and also second-class sleeping accommodations. Hot and cold running water in the rooms, finely appointed assembly cabin, and features for the entertainment of the passengers will be some of the points of the new boats. The diesel engine installations will permit a large cargo space, permitting handling of consignment of 500 tons or more.

Mr. Rathbun states that previously announced plans for construction of a fast passenger boat to supplant the steamer Georgiana on the day run had been laid aside, it having been determined that present business would not justify such an enterprise at this time.

SHIPYARDS WILL BID ON DIESELIZATION OF DISTRICT OF COLUMBIA

Specifications calling for dieselization of the Standard Oil tanker District of Columbia are being prepared and will be issued shortly at San Francisco by J. C. Rohlfs, manager of the Marine Department, Standard Oil Company (Calif.), San Francisco. The tanker is to be converted to diesel-electric propulsion. The tanker is now at the San Francisco plant of the Bethlehem Shipbuilding Corporation undergoing surveys.

According to the plans of the owners, the District of Columbia will be converted to diesel electric drive, and will be the largest ship of this type in the world. The order for her power plant has already been placed. The Busch-Sulzer Bros. Diesel Engine Company of St Louis will supply four 1000-horsepower, 2-cycle, 8-cylinder, trunk piston type diesel engines running at 275 r.p.m.

The Westinghouse Electric & Manufacturing Company received the order for electrical equipment. The plant will include a double armature type of propelling motor, which will furnish 3200 shaft horsepower to the propeller, which will turn at 90 revolutions a minute. This large motor will be approximately 19 feet long and more than 11 feet in diameter. Its power will be derived from four 700-kilowatt direct-current generators driven by non-reversing, constant speed diesel engines operating at 275 revolutions a minute. There will be two 175-kilowatt direct connected exciters coupled to the outboard engines, which will supply excitation and necessary power for all auxiliaries, which will also be motor driven.

The vessel will be electrified throughout. The Westinghouse company will supply the motors for all pumps, including four 125-horsepower vertical motors for driving cargo pumps.

NAVY ASKED BIDS ON SIX CRUISERS

Secretary of the Navy, Curtis Wilbur, has asked the shipyards of the country to submit bids on six instead of three light cruisers, following passage of an appropriation of $450,000 for the preliminary work on construction of three light cruisers authorized by the last session of Congress. President Coolidge has not yet approved the bill, but the request for bids by the Secretary of the Navy is an indication that the President will probably not oppose this construction. The Navy department now has on hand a total appropriation of $15,900,000 for this work. Bids will be opened April 5.

TO CONVERT TANKER

Sale of the tanker Chestnut Hill to the Anglo-Chilean Consolidated Nitrate Corporation of New York for the sum of $57,000 was approved by the Shipping Board February 17. Under the terms of the sale the purchaser agrees to convert the vessel to direct diesel propulsion, an operation which involves a large expenditure of money.

TANKER CONSTRUCTION IN PROSPECT

The world shortage of oil carriers has caused a great boom in the construction of this class of vessels. We regret, however, to see so many orders for American firms going to foreign yards. According to a survey recently made by one of the leading oil companies of New York, on February 1 there were under construction in the shipyards of the world, 142 tankers. Of this total, only four were building in American yards.

It is reported that the Gulf Refining Company, Pittsburgh, is considering the construction of a sister ship to the Gulfpride, which was recently completed by the Federal Shipbuilding & Drydock Co. This vessel was powered with diesel engines and was 535 feet long and of 17,400 tons deadweight. The company recently placed orders abroad for six tankers to cost about $5,000,000.

Another oil company which is said to be contemplating the immediate construction of new tonnage is the Cities Service Company of New York.

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The Standard Transportation Company, New York, on February 23, opened bids for the construction of three tankers for coastwise service. The vessels were to be 489 feet long, 62 feet 6 inches beam, 29 feet 3 inches loaded depth, and 13,400 tons deadweight. Yards were requested to submit alternative bids on one, two, or three vessels of turbine drive, reciprocating steam engines, or diesel engines.

NEW FERRY SERVICE

The Chamber of Commerce of Los Angeles has given approval to the plan for a new ferry system between San Pedro and Terminal Island to cost in the neighborhood of $500,000 and to include slips and boat, for which funds are available. George F. Nicholson is harbor engineer.

CONVERSION BIDS SUBMITTED

Bids were opened on February 15 by the Department of Maintenance and Repair, Merchant Fleet Corporation, at New York for the installation of diesel engines on the Shipping Board freighters Seminole, West Grama, and Yomachichi. The Yomachichi and Seminole are sister ships of 5950 gross tons; 416 ft. over-all, 54 ft. molded beam, and 33 ft. 9 in. depth. The West Grama is slightly longer, but of 5424 gross tons. The bids submitted were:

On the Seminole: Morse Drydock Company, $625,000; Staten Island Shipbuilding Co., $675,000; Tietjen and Lang, $579,500.

On the Yomachichi: Newport News Shipbuilding & Drydock Company, $527,500;

West Grama: Bethlehem Shipbuilding Corp., $575,000; Tietjen and Lang, $619,420.

The Seminole is to be equipped with Hamilton-M.A.N. engines built by the Hooven, Owens, Rentschler Co.; the West Grama is to have a McIntosh & Seymour engine; and the Yomachichi will be powered with a Busch-Sulzer Bros. diesel engine.

MAY RECONDITION S. S. COMFORT

It is reported that the object of the recent visit of Theodore E. Ferris, naval architect of New York, to San Francisco was to inspect, with Captain William Clark of the Clyde-Mallory Lines, the steamship Comfort with a view to reconditioning her for Atlantic coastwise service. The Comfort was formerly a transport and prior to the war was the Ward Line steamer Havana. It is reported that the cost of reconditioning this vessel for passenger service would be in the neighborhood of $500,000.

SHIPPING BOARD MAY RECONDITION TWO STEAMERS

Gen. Dalton, president of the Merchant Fleet Corp., has announced that the survey of the ships Mount Vernon and Agamemnon, which have been ordered into drydock at Norfolk, is designed to determine whether they should be reconditioned for use with the United States Lines.

Three alternatives are open if the survey leads to any decision that the boats ought to be put into service. First, either or both of them might be repaired as coal burners and placed in the passenger service. Second, they might be reconditioned as oil-burners. Third, motors might be installed. Gen. Dalton said that the first course would entail an estimated cost of $1,500,000 for each vessel, and expressed the opinion that this might be the feasible plan for the Mount Vernon at least. The estimated cost of the second plan would require about $2,000,000. The third alternative would involve from six to seven million dollars.

TO RECONDITION TANKER

The Shipping Board has approved the expenditure of $60,750 for reconditioning the tanker Gladysbee for use in the service of Shipping Board vessels. The Gladysbee, with the tanker Barden was recently offered for sale, but the offer was withdrawn because of anticipated need for the ship for fueling the Board's steamers. It is expected that the Gladysbee will be chartered while she is held in reserve for future use.

Recent Shipbuilding Contracts

Newport News Shipbuilding & Drydock Company, Newport News, Va., has an order from the U. S. War Department for an oil barge 80 by 26 by 5 ft.

This plant also has an order from the United States Merchant Fleet Corporation for reconditioning the steamship America at a cost of $1,894,000, the ship to be delivered 360 days from the date on which work is started. The cost of additional new equipment and repairs, renewals, and replacements in cabins, public rooms and other interior furnishings will bring the total cost of reconditioning the ship up to $2,487,335.

Consolidated Shipbuilding Company, Morris Heights, New York, has orders on hand for seven cruisers, ranging in length from 50 to 95 feet and powered with engines of varying horsepowers from 180 to 550. They are all of the model MR or R type.

Hanlon Shipbuilding & Drydock Company, Oakland, Calif., has an order from the Union Oil Company of California, with offices in Los Angeles, for an asphalt tow barge. The barge will be 100 ft. between perpendiculars, 40 ft. beam, and 7 ft. 6 in. loaded draft. The boat will be fitted with steam pipes to heat the asphalt for loading and discharging through pipes. Two gasoline engine driven Blackmer pumps will be installed to handle cargo.

J. C. Johnson, Port Blakely, Wn., has an order for three scows and two derrick scows for the Northwestern Fisheries Co., Seattle. This plant also has an order for a cannery and towboat for the Sunny Point Packing Company to be 75 ft. long and 17 ft. beam.

Dravo Contracting Company, Pittsburgh, Penn., has an order from the Keystone Sand and Gravel Co. for eight steel barges, 135 by 27 by 8 ft.

Marietta Manufacturing Company, Point Pleasant, W. Va., has orders from the cities of Dubuque, Minneapolis, and St. Paul for wharf boats

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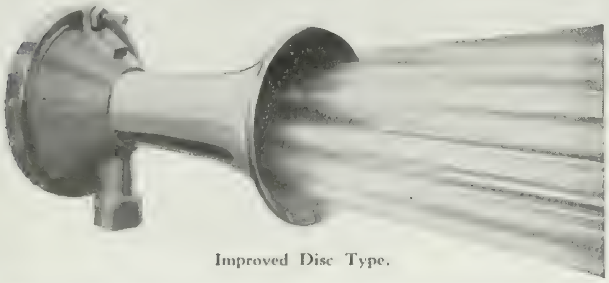

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San Diego Marine Constr. Co. ....San Diego
The McCaffrey Co. ....San Diego

to measure 214 ft. long, 45 ft. beam, and 6 ft. 6 in. depth.

Midland Barge Company, Midland, Penn. has an order from the Dillman Egg Case Company for a barge 80 by 30 by 4 ft.

Nashville Bridge Co., Nashville, Tenn., will build two additional deck barges for stock.

W. F. Stone & Son, Oakland, California, has an order from the Crowley Launch & Tugboat Company, San Francisco, for two tugs. The boats will be 80 feet long and will be powered with 250 horsepower Pacific-Werkspoor diesel engines.

Schertzer Bros., Lake Union, Seattle, Wn., has an order from the Alaska Game Commission for a 43-foot tunnel-stern river boat.

Victoria Machinery Depot Co., Ltd., Victoria, B. C., has been awarded contract by the Canadian Pacific Railway for the installation of 20 tanks with a total capacity of 170,000 gallons. These tanks will be for the stowage of fish oil transported from the reduction plants along the west coast of Vancouver Island. Fuel storage tanks with capacity to enable a cruising radius of 5000 miles will also be installed.

The Sun Shipbuilding Company, Chester, Pa., reports three new contracts for oil tanker construction. One is to be a motor tank barge for the Beacon Oil Company; one is a 13,000-ton motor tanker for the Sun Oil Company; and the third is a tank vessel for the California Petroleum Corp. Details of the three vessels are not yet available.

The Astoria Shipbuilding Company, Astoria, Oregon, has recently received a contract from Dr. H. C. Watkins of Hoquiam, Washington, for a 65-foot pleasure boat to cost about $30,000.

The Wisconsin Bridge Company, Milwaukee, Wisconsin, has an order from Edward T. Gillen of Milwaukee for two 90-ft. pile driver barges. These will be built under the Ellis Channel system of steel hull construction.

Peninsula Shipbuilding Company, Portland, Oregon, is building a 130-foot ferryboat for the Union Pacific Railroad of Astoria. The boat will be powered with a 300-horsepower Washington-Estep diesel engine and will have capacity for 35 automobiles and 250 passengers. Ferry slips are being built at Astoria and Megler, Wn.

Schertzer Bros., Seattle, has an order for a 43-foot tunnel stern river boat from the Alaska Game Commission. The boat will be of wooden construction and equipped with a 50-horsepower engine. Coolidge & Hanson are the naval architects.

KEEL LAYINGS

Oil tow barge for Union Oil Company, by the Hanlon Drydock & Shipbuilding Co., Feb. 21.

Halibut boat for M. J. Iverson, by Prince Rupert Drydock and Shipyards, Feb. 1.

Three keels laid for barges for the Iron City Sand & Gravel Co., by American Bridge Co., during Feb.

Launching of the diesel-electric ferryboat Stockton, March 5, 1927, at the Union Plant, Bethlehem Shipbuilding Corp., San Francisco, for the Southern Pacific Company.

Keels laid for the last two of an order for 33 Coast Guard cutters by American Brown Boveri Electric Corp., during Feb.

Two guide docks for E. T. Slider, New Albany, Ind., by Howard Shipyards & Dock Co., Feb. 28 and Mar. 1.

Tank steamer for Tidewater Oil Co. by Sun Shipbuilding Co., Mar. 1.

B. F. Affleck, freighter for Pittsburgh Steamship Co. by Toledo Shipbuilding Co., Feb. 1.

Steel sand and gravel dredge hull for E. T. Slider, New Albany, Ind., by Midland Barge Co., Mar. 1.

LAUNCHINGS

Stockton, diesel - electric ferryboat, for Southern Pacific Co., by Bethlehem Shipbuilding Corp., Mar. 5

Santa Rosa, diesel-electric ferryboat for Southern Pacific Co., by General Engineering & Drydock Co., Mar. 17.

Kadiak, pile driver scow for Kadiak Fisheries Co., by J. C. Johnson's Shipyard, Feb. 2.

Tugboat for Granby Consolidated Mining, Smelting & Power Co., by Prince Rupert Drydock and Shipyards, Feb. 2.

Evangeline, twin-screw passenger and freight steamer for Eastern Steamship Lines, by Wm. Cramp & Sons Ship & Engine Building Co., Feb. 12.

Northland, coast guard cutter, for U. S. Coast Guard by Newport News Shipbuilding & Drydock Co., Feb. 5.

Gulfsprite, twin screw motor tank barge for Gulf Refining Co. by Sun Shipbuilding Co., Feb. 26.

Wabash, car ferry for Wabash Ry. Co., by Toledo Shipbuilding Co., Mar. 19.

DELIVERIES

Hydraulic Dredge for American Dredging Co., by Sun Shipbuilding Co., Feb. 14; Gulfspray, twin screw motor tank barge for Gulf Refining Co., Mar. 5.

W. A. Shepard, towboat for W. C. Kelly Barge Line, by Chas. Ward Engineering Works, Mar. 15.

Three barges for U. S. Engineers, St. Louis, by American Bridge Co., during Feb.; five barges for Wheeling Steel Corp., Mar. 1.

Four steel motor patrol boats for U. S. Coast Guard by American Brown Boveri Electric Corp. during Feb.

W. A. Baldwin, Frederick Peirce, and Frank E. Gannett, diesel-electric ferryboat to Electric Ferries, Inc., during Feb.; two barges to Reading Co., during Feb.

Steel hull for stmr. Mississippi of the Mississippi River Com., by Howard Shipyards & Dock Co., Feb. 8; two steel guide docks for E. T. Slider, Feb. 16 and 28.

American Legion, ferryboat for City of New York by Staten Island Shipbuilding Co., Feb. 15.

YARD NOTES

Yarrows, Ltd., of Victoria, B.C., has announced that its plant will be enlarged. Bids have been called for a new administration building.

White Bros., one of the leading hardwood firms of San Francisco, is building a plant on the eastern side of San Francisco Bay at High Street, Oakland, between East Twelfth Street and the Estuary. J. H. Pedgrift, Oakland contractor, is building warehouses which will accommodate several million feet of oak, ash, hickory, mahogany, iron bark, Philippine mahogany, and other hardwoods.

William Muller, shipbuilder of Wilmington, Calif., has recently launched the tug Louie Black for the Wilmington Transportation Company. The tug is a sister to the D. M. Renton and David P. Fleming built a year and a half ago. Each is ninety feet long and equipped with 400-horsepower Winton full diesel engines.

Muller started construction March 8 of the first of two rock barges for the same company to be 120 feet long and 36 feet beam. All this equipment will be used in transporting ore and rock from Catalina Island to the mainland.

N. M. McLean, Prince Rupert, B.C., is building a 48-foot halibut fishing boat for John Wick of the same port.

W. R. Menchions, Vancouver, B.C., is building a 75-foot tug for the Kelly Logging Co.

The Pacific Steamship Company (Admiral Line) with headquarters in Seattle, have announced the purchase of the steamers Mary Weems and Esther Weems from the Baltimore & Carolina Steamship Company. These two vessels will be placed on the run between Portland, San Francisco, and Los Angeles.

In Pacific Coast *Shipyards*

Ship Repairing — Ship Building — Reconditioning — Engine Repairing

Three of the diesel-electric vehicular ferryboats building at San Francisco Bay shipyards for the Southern Pacific Company were launched during March.

The first was the ferryboat Stockton for San Francisco-Oakland ferry work, launched by the Bethlehem Shipbuilding Corp., on March 5.

The Ferryboat Santa Rosa, for the San Francisco-Sausalito run of the Northwestern Pacific Railroad, was launched by the General Engineering & Drydock Company, Alameda, on March 17.

The Moore Dry Dock Company, Oakland, launched the ferryboat Tahoe on March 23.

George Armes, president of the General Engineering & Dry Dock Company, Alameda, has announced that an expansion program will be carried on by his company, which will greatly increase the capacity and output of the plant for ship construction and repairs. The program contemplates the purchase and improvement of more land adjoining the company's property at Alameda and the immediate construction of a 425-foot drydock with capacity for vessels of 12,500 tons.

REPAIR AWARDS

Theodore A. Crane's Sons, Brooklyn, N.Y., have received a contract from the American Merchant Marine Steamship Corp. for converting the steamer Eastern Mariner from a coal to an oil burner. Bids were submitted by a number of Atlantic Coast shipyards, the low bid of $38,657 and 30 days being submitted by the T. A. Crane's Sons.

Bethlehem Shipbuilding Corp., Ltd., San Pedro plant, has contract for repairs to the General Petroleum tanker Seekonk, which was damaged in a collision recently. Work will cost approximately $16,000.

Todd Dry Docks, Inc., Seattle, have a repair job which will cost about $50,000. Work will be done on the steamship Eurana of the Planet Steamship Company which collided with a bridge over Second Narrows, Burrard Inlet, recently. Her upperworks as far back as her funnels were carried away.

Progress of Construction

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT

Potrero Works, San Francisco

Purchasing Agent: O. W. Streett.

Fresno, hull 5331, double-end diesel-electric vehicular ferryboat for Southern Pacific Co., San Francisco; 256′ L.O.A.; 44′10″ beam; 19′ depth; four Nelseco diesel engines. 450 H.P. each; keel Nov. 8/26; launched Jan. 15/27.

Stockton, hull 5332, sister to above; keel Nov. 20/26; **launched March 5/27.**

Not named, hull 5333, sister to above; keel Jan. 20/27.

GENERAL ENGINEERING & DRYDOCK CO.,

Alameda, California

Purchasing Agent: Al. Wanner.

Golden Bear, hull 3, diesel-electric wooden auto ferry for Golden Gate Ferry Co.; 240′ L.B.P.; 44′ beam; 11′ 6″ loaded draft; 13 knots speed; 3-400 B.H.P. Ingersoll-Rand diesel engines, direct connected to Westinghouse generators; keel Oct. 28/26; launched Feb. 2/27.

Golden Poppy, hull 4, sister to above; keel Nov. 22/26.

Golden Shore, hull 5, sister to above; keel Feb. 5/27 est.

Santa Rosa, hull 6, diesel-electric, steel automobile ferryboat for Southern Pacific Co.; 236′ L.B.P.; 44′ 10″ beam; 12′ 6″ loaded draft; 13 knots speed; 4-450 B.H.P. Nelseco diesel engs. connected to General Electric generators; keel Oct. 28/26; **launched Mar. 17/27.**

J. C. JOHNSON'S SHIPYARD

Port Blakely, Wn.

Kadiak No. 2, hull 94, pile driver scow for Kadiak Fisheries Co., Seattle; 65 by 24 ft.; **launched Feb. 2/27.**

Hull 95, cannery tender for Sunny Point Packing Co., Seattle; 75 by 17 ft.

Selig No. 1, hull 96, fish scow for Capt. Steve Selig, Ketchikan, Alaska; 60 by 18 by 4ft.

B. F. No. 1, hull 97, scow for Northwestern Fisheries Co., Seattle; 60x18x5 ft. 6in.

B.F. No. 2, hull 98, scow same as above.

B. F. No. 3, hull 99, scow, same as above.

Tuxekan, hull 100, derrick scow for Northwestern Fisheries Co.; 70x24x5ft. 2in.

Grindall, hull 101, derrick scow, same as above.

Hull 106, cannery tender and towboat for Sunny Point Packing Co., Seattle: 75x17ft.

HANLON DRYDOCK & SHIPBUILDING CO.

Oakland, Calif.

No name, hull 91, tow barge for Union Oil Co.;

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Marine Type
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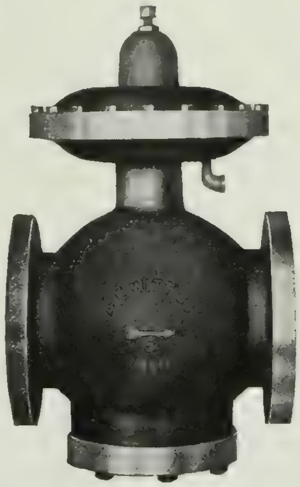

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Ship Repairing - Ship Building - Reconditioning - Engine Repairing

100 L.B.P.; 40 beam, 7ft 6in loaded draft, **keel Feb. 21/27;** launch Mar. 21/27 est.; deliver Apr. 14/27.

LAKE WASHINGTON SHIPYARDS.

Houghton, Wash.

Purchasing Agent: A. R. Van Sant.

Cruiser for Stewart Edward White, 58 feet L.B.P.; 65 H.P. Washington-Estep diesel eng.; keel Oct. 11/26.

Fishing boat for Geo. Brown, 65 ft. long; 80 H.P. Worthington diesel engines.

Cannery tender for Libby, McNeill & Libby Seattle; 75 ft. long; 2-50 H.P. Standard engs.

Fishing boat for Libby, McNeill & Libby, Seattle; 65 ft. long; 65 H.P. Washington-Estep diesel.

Scow for Libby, McNeill & Libby, Seattle; 66 ft. long.

Two river boats for Day, Seattle; ea. 65 ft. long.

Two river scows for Day, Seattle; 80 ft. long.

Cannery tender for Sunny Point Packing Co.; 50 ft. long; 100 H.P. Hall-Scott eng.

Troller for B. Thompson; 42 ft. long; 27 H.P. Acme eng.

LOS ANGELES SHIPBUILDING & DRY DOCK CORPORATION

San Pedro, Calif.

Barge No. 1, hull 53, oil barge for California & Eastern Oil Co., Los Angeles; 131 L.B.P.; 40 beam; 9-6 loaded draft; 1050 D.W.T.; keel Dec. 27/26; launch Feb. 7/27 est.

THE MOORE DRY DOCK COMPANY

Oakland, California.

Purchasing Agent, Nat Levy.

Peralta, hull 170, double-ended, screw propelled **ferryboat for Key System Transit Co.; 256 L.B.P.; 47 molded beam; 21 molded depth; 14.5 normal speed;** turbo-electric **propulsion; water-tube** boilers; keel May 3/26; launched Oct. 14/26; deliver Mar. 14/27 est.

Yerba Buena, hull 171, sister to above; keel May 3/26; launched Nov. 22/26; deliver Mar. 25/27 est.

Tahoe, hull 172, diesel-electric, steel, vehicular ferryboat for Southern Pacific Company; 236′ L.B.P.; 44′10″ beam 12′6″ loaded draft; 13 knots speed; 1250 S.H.P. Nelseco diesel engs.; connected to Westinghouse generators; keel Dec. 8/26; launch Mar. 23/27 est.

Not named, hull 173, sister to above; keel Dec. 8/26; launch Apr. 2/27 est.

PRINCE RUPERT DRYDOCK AND SHIPYARDS

Prince Rupert, B.C.

One 75-foot tugboat for Granby Consolidated Mining, Smelting & Power Co.; 120 H.P. Washington-Estep diesel eng.; **launched Feb. 3/27.**

No name, halibut boat for M. J. Iverson; 58′ L.O.A.; **keel Feb. 1/27.**

W. F. STONE & SON

Oakland, Calif.

Purchasing Agent: Lester Stone.

No name, motor cruiser, for stock, 36x10x3½ ft.; 12 mi. speed; 65-HP. gas engines.

Northern Light, hull 824, yacht for John Borden; 140 L.B.P.; 30 beam; 14 loaded draft; 10 mi. speed; 360 I.H.P. diesel engs.; keel Sept. 1/26; launched Jan. 19/27; deliver May 1/27 est.

Not named, hull 828, yacht for Frank B. Drake; 55 L.B.P.; 13 beam; 6 loaded draft; 7 mi. speed; 30 I.H.P. gas eng.; keel Aug. 25/26 deliver May 1/27 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY

Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Two towboat hulls for Carnegie Steel Corp., Pittsburgh; 149′ 2″ x 33′ 4″ x 5′ 10-5/16″; one delivered.

Six barges for U. S. Engineers, St. Louis, 152x34x7 ft.; **3 delivered.**

Five barges for Wheeling Steel Corp., 140x26x10 ft., **all delivered Mar. 1/27.**

Fifteen barges for Carnegie Steel Co., 175x26x11 ft.; **11 delivered.**

One derrick boat hull for T. Smith & Son, Inc., New Orleans; 110′x50′x10′.

30 coal barges for Carnegie Steel Co.; 175x26x11 ft

10 barges for Iron City Sand & Gravel Co.; 135 x 27 x 7 ft. 6in.; **3 keels laid.**

AMERICAN BROWN-BOVERI ELECTRIC CORP.

Camden, N. J.

Purchasing Agent: L. G. Buckwalter

Hull 325, steel motor patrol boat for U. S. Coast Guard, Washington, D.C.; 125 L.O.A.; **23′6″ molded beam; 220 tons displacement; Winton diesel** engs.; keel Sept./26; launched Jan. 1/27; **delivered Feb./27.**

Hull 326; same as above; keel Sept./26; launched Jan./27; **delivered Feb./27**

Hull 327, same as above; keel Sept./26; launched Jan./27; **delivered Feb./27**

Hull 328, same as above; keel Sept./26; launched Jan./27; **delivered Feb./27.**

Hull 329, same as above; keel Sept./26; launched Jan./27.

Hull 330, same as above; keel Sept./26; launched Jan./27.

Hull 331, same as above; keel Sept./26; launched Jan./27.

Hull 332, same as above; keel Nov./26.

Hull 333, same as above; keel Nov./26.

Hull 334, same as above; keel Nov./26.

Hull 335, same as above; keel Nov./26.

Hull 336, same as above; keel Nov./26.

Hull 337, same as above; keel Nov./26.

Hull 338, same as above, keel Dec./26.

Hull 339, same as above; keel Dec./26.

Hull 340, same as above; keel Dec./26.

Hull 341, same as above; keel Dec./26.

Hull 342, same as above; keel Dec./26.

Hull 343, same as above; keel Dec./26.

Hull 344, same as above; keel Feb. 1/27.

Hull 345, same as above; keel Feb. 1/27.

Hull 346, same as above; keel Feb. 1/27.

Hull 347, same as above; keel Feb. 1/27.

Hull 348, same as above; keel Feb. 1/27.

Hull 349, same as above; keel Feb. 1/27.

Hull 350, same as above; **keel Feb./27.**

Hull 351, same as above; **keel Feb./27.**

W. A. Baldwin, hull 355, diesel-electric vehicular ferryboat for Electric Ferries, Inc., New York; 155 L.O.A.; 48′6″ beam; 14′4″ depth; keel June/26; **delivered Jan./27.**

Frederick Peirce, hull 356, same as above, keel June/26; **delivered Jan./27.**

Frank E. Gannett, hull 357, same as above; keel June/26; **delivered Jan./27.**

Hull 360, barge for Reading Co., 110x32x9.5 ft.; **delivered Feb./27.**

Hull 361, same as above; **delivered Feb./27.**

Hull 364, carfloat for Reading Co.; capacity 10 cars; keel Jan./27.

Hull 365, carfloat for Reading Co., capacity 10 cars; keel Jan./27.

Hull 366, carfloat for Reading Co., capacity 8 cars; keel Jan./27.

Hull 367, carfloat for Reading Co., capacity 8 cars; keel winter /27 est.

Hull 368, carfloat for Reading Co., capacity 8 cars; keel winter /27 est.

Hull 369, carfloat for Reading Co., capacity 8 cars; keel winter /27 est.

Hull 370, carfloat for Brooklyn Eastern Dist. Terminal, 340x38x11ft.; capacity 23 cars; **keel Mar./27.**

THE AMERICAN SHIP BUILDING COMPANY

Cleveland, Ohio.

Purchasing Agent: C H. Hirsching

Wm. McLauchlan, hull 793, bulk freighter for Pickands, Mather & Co.; 580 L.B.P.; 60 beam; 20 loaded draft; 13 mi. loaded speed; 12,000 D.W.T.; T.E. engs.; 2400 I.H.P.; 3 B. & W. boilers 200 lbs. pressure; keel July 19/26; launched Oct. 7/26; deliver Apr. 15/27 est.

Robert Hobon, hull 794, sister to above keel Aug. 9/26; launched Oct. 30/26; deliver Apr. 15/27 est.

L. E. Black, hull 795, bulk freighter for Inland

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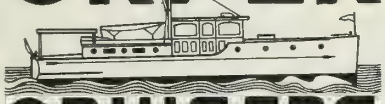

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California

Steel Co.; 596 L.B.P.; 64 beam; 20 loaded draft; 13 mi. speed; 13,500 D.W.T.; T.E. engs.; 2700 I.H.P.; 3 Scotch boilers, 24'6"x11'x185 lbs.; keel Nov. 8/26; launched Feb. 1/27; deliver Apr. 15/27 est.

Geo. M. Humphrey, hull 796, bulk freight steamer for Kinsman Transit; 580 ft. L.B.P.; 60 ft. beam; 20 loaded draft; 13 mi. speed; 12,000 D.W.T.; triple expansion engs.; 2500 I.H.P.; 3 Scotch boilers, 14x11; 159 lbs. pressure; keel Oct. 18/26; launched Dec. 30/26. deliver April 15/27 est.

Carl D. Bradley, hull 797, self-unloading bulk freighter for Bradley Transport. Co.; 615 L.B.P.; 65 beam; 20 loaded draft; 14 mi. speed; 13,000 D.W.T.; turbo-electric drive; 4000 I.H.P.; 2 water tube boilers; 325 lbs. pressure; keel Jan. 10/27; launch Apr. 2/27 est.; deliver July 1/27 est.

Harry Coulby, hull 798, bulk freighter for Pickands, Mather & Co.; 607' L.B.P.; 65' beam; 33' loaded draft; 13 mi. speed; 13,800 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 B. & W. boilers; 200 lbs. pressure; keel Feb. 7/27; launch Apr. 23/27 est.; deliver July 1/27 est.

Not named, hull 799, tug for Michigan Limestone & Chemical Co., 83'6" L.B.P.; 24 beam; 12 draft; 12 mi. speed; compound engs. 900 I.H.P.; 1 fire tube boiler, 160 lbs. pressure; keel Mar. 1/27 est.; launch Apr. 9/27 est.; deliver May 1/27 est.

Not named, hull 800, bulk oil barge for Standard Transportation Co.; 258 L.B.P.; 40 beam; 10 draft; keel Mar. 21/27 est.; launch July 13/27 est.; deliver July 27/27 est.

Not named, hull 801, oil barge for Standard Transportation Co., sister to above; keel Mar. 21/27 est., launch July 13/27 est.; deliver July 27/27 est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT

Quincy, Mass.

Lexington, hull 1300, airplane-carrier U.S.N., launched Oct. 3/25

Governor Carr, hull 1401, ferryboat for Jamestown-Newport Ferry Co.; 150'x48'x14'; 703 gro. tons, keel Oct. 11/26.

Hull 1402, carfloat, N.Y., N.H. & Hartford R.R.; 360'x40'x11'6"; 1375 gro. tons; keel July 14/26.

Hull 1403, carfloat, same as above; keel July 15/26

Hull 1404, carfloat, same as above; keel July 16/26

Hull 1405, carfloat, same as above; keel July 16/26

Hull 1406, oil barge for City Service Transport Co. 204'x35'6"x14'3"

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT

Wilmington, Del.

Not named, hull 3511, oil barge for Seaboard Shipping Corp., 17[illegible]'x37'x12'6", keel Oct. 12/26, launch Dec. 22/26 est., deliver Dec. 29/26 est.

BETHLEHEM SHIPBUILDING CORP., BALTIMORE DRY DOCK

Baltimore, Md.

Hull 6136, carfloat for Western Maryland R.R.; 190'x35'x9'; keel Aug. 12/26.

CHARLESTON DRY DOCK AND MACHINERY COMPANY

Charleston, S. C.

Purchasing Agent: Charles R. Valk.

Towboat, owner not named. 64 ft. long; keel Nov. 17/26; launched Feb. 2/27.

Dredge for Gulf Refining Co.; 95'x30'x8'; keel Oct. 11/26; launched Dec. 7/27.

CONSOLIDATED SHIPBUILDING CORPORATION

Morris Heights, N. Y.

Hull 2867, cruiser for George G. Bourne; 81x14 ft. 6 in.. 2 Wright Typhoon engs., 550 H.P. ea.

Hull 2868, cruiser for Geo. F. Baker, Jr.; 70 x 12 ft. 6 in.; 2 Model R. Speedway engs., 300 H.P. each.

Hull 2870, cruiser for H. N. Slater; 60x10 ft. 10 in.; 2 Model M.R. Speedway engs.; 180 H.P. each.

Hull 2872, cruiser for B. H. Borden; 95 x 16 ft.; 2 Model R Speedway engs., 300 H.P. ea.

Hull 2874, cruiser for Clifford V. Brokaw; 85x14 ft. 6 in.; 2 Model R. Speedway engs. 300 H. P. each.

Hull 2875, cruiser for Adolph Dick, 54x11 ft. 6 in.. 2 Model M.R. Speedway engs., 180 H.P. ea.

Hull 2877, cruiser for E. W. Clark; 50x10; one Model M.R. Speedway eng., 180 H.P.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.

Philadelphia, Pa.

Purchasing Agent: Ed. C. Geehr.

Malolo, hull 509, express pagr and frt liner. Matson Navigation Co.; 582 LOA; 577 length at water line; 83 ft beam; depth molded to C deck 54 ft.; displacement 22,050 tons; **8250 DWT;** speed 22 knots regular, 23 knots **maximum; 25,000 shaft horsepower;** Cramp-Parsons turbines; oil burning B & W water-tube boilers; keel May 4/25. launched June 26/26; deliver May 1/27 est.

Yarmouth, hull 518, twin screw passenger and freight steamer for Eastern Steamship Lines; 378 **length at water line; 55-6 beam; 29-6 molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears, six single-ended** Scotch boilers; keel Feb. 23/26; launched Nov. 6/26; deliver Apr. 1/27 est.

Evangeline, hull 524, twin screw passenger and freight steamer for Eastern Steamship Lines; **378 length at water line; 55'6" beam; 29'6" molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears; 6 single-ended Scotch** boilers; keel May 1/26; **launched Feb. 12/27;** deliver May 1/27 est.

Salt Lake City, hull 531, light cruiser for United States Navy; 10,000 tons displacement; keel Apr./ 7 est.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

Purchasing Agent: G. O. Williams.

Comoco, hull 122, steel yacht for R. W. Judson, Detroit; 140' L.B.P.; 23'6" beam; 8'9" loaded draft; 15 mi. speed; 260 D.W.T.; 600 I.H.P. diesel engs; keel Dec. 15/26; launch May 1/27 est.; deliver June 1/27 est.

Helen, hull 121, steel yacht, for Chas. E. Sorensen, Detroit; 105 L.B.P.; 17' beam; 6' loaded draft; 13 mi. speed; 110 D.W.T.; 200 I.H.P. diesel engs.; keel Nov. 1/26; launch Apr. 15/27 est.

DRAVO CONTRACTING COMPANY

Pittsburgh, Pa.

Hulls 498-502 inc., 5 steel barges for stock; 230x45x11 ft.; 650. gro tons ea.

Hull 534, 1 ladder type sand and gravel dredge for Pittsburgh Plate Glass Co.; 155x44x8ft., 430 gross tons.

Hulls 537 and 538, two steel whirler boat hulls for Contracting Dept.; 40x48x5'6"; 100 gro tons

Hull 539, 1 diesel engined towboat for Labelle Transportation Co., 110'x26'x5'; 215 gro. tons.

Hulls 546, 549, 550 3 pile driver hulls for U.S. Engineers, St. Louis; 88'x25'x4'; 100 gro. tons ea

Hulls 540-543 inc.; 4 steel barges for Keystone Sand & Supply Co.; 135'x27'x8'; 320 gro. tons ea.

Hull 553-566 inc., 14 steel barges for Mississippi River Commission, Memphis; 120'x30'x7'4"; 430 gro. tons ea

Hulls 569-572 inc., 4 steel hopper type barges for Pittsburgh Plate Glass Co., 135x26x10 ft. 320 gro. tons ea

Hulls 577-578, 2 dump scows for Pittsburgh Plate Glass Co.; 110x26x8 ft. 6in.; 220 gro tons, ea

Hull 579, steam dredge for Ohio River Gravel Co.; 120 x 32 x 6 ft.; 200 gro tons

Hull 580, steel hull "A" frame derrick boat for Pittsburgh Plate Glass Co.; 72 x 34 x 5 ft.; 120 gro tons.

Hulls 581-590 inc., 10 standard steel barges for stock; 100x26x6 ft. 6 in.; 135 gro. tons each.

Hulls 591-600 inc., 10 standard steel barges for stock, 100x26x6ft. 6in.; 135 gross tons each.

Hulls 601-604 inc., 4 steel barges for Keystone Sand & Supply Co.; 135x27x8ft.; 320 gr. tons ea.

Hulls 605-612 inc., 8 steel barges for Keystone Sand & Supply Co.; 135 x 27 x 8ft.; 320 gr. tons each.

Hull 613, steam dredge for stock; 2 cu. ft. capacity; 120x32x6ft.

Hull 614, one diesel engine towboat for stock; 110x26x5 ft.; 215 gro. tons.

DUBUQUE BOAT & BOILER WORKS

Dubuque, Iowa

Purchasing Agent: A. L. Yehger.

Two steel dump scows for U.S. Engineers, Louisville, Ky.

Thorpe, river towboat for Upper Mississippi Barge Line Co. & Inland Waterways Corp.; 132'x35'x3'6"; stern wheel, tandem comp. surface condensing engs.; 15"x30"x78" stroke; keel Oct. 1/26 est.; launch Mar. 1/27 est.; deliver Apr. 1/27 est.

Weber, river towboat, sister to above; keel Oct. 1/26 est.; launch Mar. 1/27 est.; deliver Apr. 1/27 est.

Morse, river towboat, sister to above; keel Oct. 1/26 est; launch Mar. 1/27 est; deliver Apr. 1/27 est.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY

Kearny, N. J.

Purchasing Agent: R. S. Page.

Gulfpride, hull 86, tanker for Gulf Refining Co.; **525' L.B.P.; 74' beam; 28' loaded draft; 11 knots** speed; 17,400 D.W.T.; 4500 I.H.P. diesel engs.; keel June 15/26; launched Jan. 20/27; deliver Apr. 1/27 est.

No name, hull 89, passenger and freight steamer for Southern Pacific Steamship Lines, Pier 49, North River, New York; 427 L.B.P.; 60 beam; 25'6" loaded draft; 6700 D.W.T.; De Laval steam turbines; 7700 S.H.P.; 4 B. & W. boilers, 21,900 sq. ft. heating surface; 16,000 sq. ft. superheating surface; keel Jan. 31/27.

Hull 90, carfloat for Lehigh Valley Railroad; 278x39x10ft.

Hull 91, same as above.

Hull 92, same as above.

Hull 93, carfloat for D. L. & W. Railroad, 278x39x10 ft.

Hull 94, same as above.

Hull 95, same as above.

GREAT LAKES ENGINEERING WORKS

River Rouge, Mich.

Purchasing Agent: Chas. Short.

H. F. Harvey, hull 256, bulk freighter for Pittsburgh Steamship Co., Cleveland; 580 L.B.P.; 60 beam, 20 loaded draft; T.E. engs.; 2200 I.H.P.; 3 Scotch boilers 12' diam. by 11'6"; keel Jan. 3/27; launch Apr. 9/27 est.; deliver May 30/27 est.

S. T. Crapo, hull 256, bulk cement freighter for Huron Transportation Co.; 385 L.B.P.; 60 beam; 19 loaded draft ;11 mi. speed; 7200 D.W.T.; T.E. engs.; 1800 I.H.P.; 3 Scotch boilers, 12 ft. 9 in. diam.; keel April 15/27 est.; launch Aug. 1/27 est.; deliver Oct. 1/27 est.

HOWARD SHIPYARDS & DOCK COMPANY

Jeffersonville. Ind.

Purchasing Agent, W. H. Dickey.

Hull 1593, steel hull for stmr. Mississippi of Mississippi River Com., St. Louis, Mo.; keel Sept. 25/26; **launched Feb. 3/27; delivered Feb. 8/27.**

Hull 1597, steel guide dock for E. T. Slider, New Albany, Ind.; 120'x24'x4'; keel Nov. 16/26; **launched Feb. 15/27; delivered Feb. 16/27.**

Hull 1598, same as above; keel Nov. 26/26; **launched Feb. 24/27; delivered Feb. 28/27.**

Hull 1599, same as above, **keel Feb. 28/27.**

Hull 1600, same as above, **keel Mar. 1/27.**

Hull 1601, hull for Baton Rouge Car Terminal, Baton Rouge, La.; 285'x60'x9'6"; keel March 15/27 est.

Not named, hull No. 1603, diesel ferryboat for Tri-State Ferry Co., Cairo, Ill.; 100 L.B.P.; 30' beam; 5' depth; 9 mi. loaded speed; 125 D.W.T.; 6-cyl. diesel eng.; 180 I.H.P.; keel Jan. 3/27; launch Mar. 14/27 est.

MANITOWOC SHIPBUILDING CORPORATION

Manitowoc, Wis.

Purchasing Agent: H. Meyer.

Hull 227, one car ferry for Grand Trunk Milwaukee Car Ferry Co.; 360' L.O.A.; 58' molded beam; 21'6" depth; 2 T.E. engs.; 4 Scotch boilers; launch Jan. 19/27 est.; deliver Mar. 1/27 est.

MARIETTA MANUFACTURING COMPANY

Point Pleasant, W. Va.

(Continued on Page 204.)

Large jobs and small—
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The modern cement kiln is an industrial mammoth 8 ft. in diameter and 125 ft. long and made of heavy 5/8″ steel plates. It can be completely constructed by the oxy-acetylene welding process, and those so made are giving exceptionally good service. By the same method the tiny contact wires of a radio tube are joined together.

No other process of construction works so satisfactorily under different conditions. The kind, the analysis and the thickness of the metal to be welded may vary widely. The type of construction may be rugged or delicate, approximate or precise, yet the oxy-acetylene process is so flexible that it is easily adapted to every special need.

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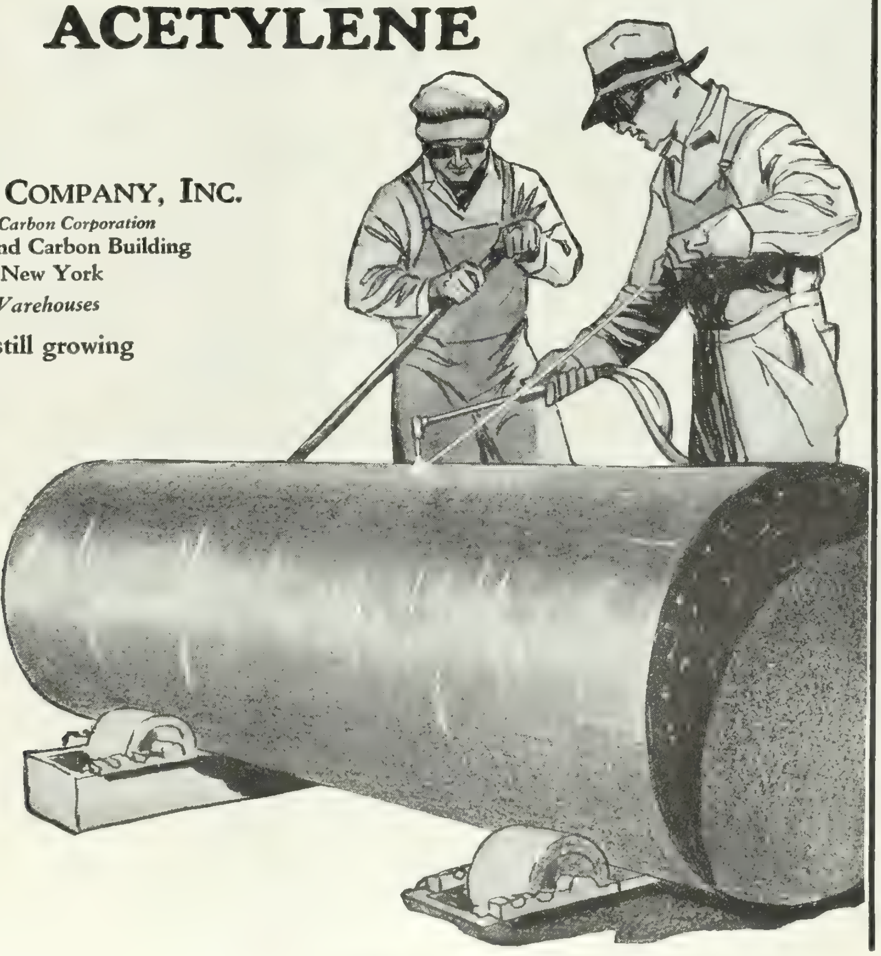


Purchasing Agent: S. C. Wilhelm.

Thirty steel discharge pontoons for U.S. Army Engineers, Rock Island, Ill.; 38'x14'x3'2"; 3 launched.

One steel stern-wheel towboat for Magdalena River, Colombia, 125'x26'x5'; tandem compound engs.; keel laid; deliver July 1/27 est.

Twelve steel hoppered cargo barges for Magdalena River, Colombia; 125'x26'x6'; **9 launched.**

Wharf boat for city of Dubuque, Iowa; 214x45x6ft. 6in

Wharf boat for Minneapolis, 214x45x6ft. 6in

Wharf boat for St Paul, 214x45x6 ft. 6in.

MIDLAND BARGE COMPANY

Midland, Pa.

Purchasing Agent: H. S. Neal.

Fifteen barges for Inland Waterways Corporation. 126'x33'x7'6". 6 keels laid; **11 launched; 8 delivered**

Steel sand and gravel dredge hull for E. T Slider, New Albany, Ind.; 175'x50'x6'; **keel March 1/27.**

One hull for Dillman Egg Case Co , 30x80x4ft.

MIDLAND SHIPBUILDING COMPANY, LTD.

Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

City of Hamilton, hull 18, package freighter for Canada Steamships, Ltd.; 230 L.O.A.; 38 beam: 23 depth; T.E. engs.; keel Oct. 11/26; launched Jan. 12/27; deliver Apr. 15/27 est.

City of Montreal, hull 19, package freighter same as above; keel Oct. 11/26; launched Jan. 12/27; deliver Apr. 15/27 est.

Not named, hull 20, package freighter for Canada Steamship Lines, Ltd.; 250 L.B.P.; 42 beam; 26 ft. 6 in. draft; keel Jan. 18/27; deliver May 15/27 est.

Not named, hull 21, sister to above; keel Jan. 18/27; deliver May 15/27 est.

NASHVILLE BRIDGE COMPANY

Nashville, Tenn.

Purchasing Agent: Leo E. Wege.

Hull 108, dredge, owner not named; clam shell bucket type; 110'x51'6"x8'; steam eng.; keel Sept. /27 est.

Hulls 113 to 118 inc., deck barges for stock; keels Apr./27 est.

Hull 119, deck barge, for stock; 130x34x8 ft.; keel Apr./27 est.; launch May/27 est.

Hull 120, deck barge, for stock; 130x34x8 ft.; keel Apr./27 est.; launch May/27 est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas: Plummer, 233 Broadway New York City.

Iroquois, hull 306, passenger and freight **steamship for Clyde Steamship Company, New York, 407'-3" overall, 62'-0" beam, 30'-6" depth, Newport News turbines and gear; 8500 I.H.P.; Scocth** boilers; oil burning; keel March 20/26; launched Dec. 11/26; deliver Apr./27 est.

Shawnee, hull 307, sister to above; keel May 15/26; launch Apr./27 est.

California, hull 315, 18-knot, passenger liner **for Panama Pacific Line, New York; 600 ft. long, 80 ft. beam, 52 ft. depth; watertube boilers for oil 22,000 gross tons; 17,000 I.H.P.; keel Mar. 20/26;** launch Aug./27 est.

Northland, hull 318, coast guard cutter for U. S. Government; 216' long; 39' beam; 24'9" draft; diesel-electric propulsion; McIntosh & Seymour engs.; keel Aug. 16/26; **launched Feb. 5/27;** deliver May/27 est.

Caracas, hull 319, passenger and freight steamer for Red D Line, New York; 335'4" L.O.A.; 51' beam; 22' draft; Newport News turbines and gears; water-tube boilers; 3560 D.W.T.; 4000 S.H.P.; keel Nov. 18/26; launch June/27 est.

Hull 320, oil barge for U. S. War Dept.; 80x26x5ft.; **keel Feb. 25/27;** launch Apr./27 est.

THE PUSEY AND JONES CORP.

Wilmington, Del.

Purchasing Agent: James Bradford.

Not named, hull 1031, single screw passenger **freight steamer for Baltimore & Philadelphia Steamboat Co., Philadelphia; 219 L.B.P.; 45 beam; 11 loaded draft; 14½ mi speed; 4 crank, TE engs. 21-32-35-35 by 24"; two B. & W. water-tube** boilers, 3046 sq. ft. heating surface each.

Peter Stuyvesant, hull 1033, steel single screw day steamer for Hudson River Day Line, New York; 252 L.B.P.; 46 beam; 4-cycle, triple expansion engs.; 2800 I.H.P.; 4 B. & W. water-tube boilers; 11x12 200 lbs. pressure; keel Sept. 15/26; launched Feb. 2/27, deliver May 1/27 est

Not named, hull 1034, steel twin-screw diesel yacht from Henry J. Gielow, Inc , naval architect, for Col. Edward Green, New York, 294' L.O.A.; 38'3" beam, 16' loaded draft; 2 Bessemer diesel engs , total of 3000 H.P.; keel March 15/27 est.

STATEN ISLAND SHIPBUILDING COMPANY

Mariner's Harbor, N. Y.

Purchasing agent: R. C. Miller.

American Legion, hull 764, ferryboat for City of New York, 264 L.O.A.; 66 beam over-all, 47 beam mld ; 14 loaded draft; 15 mi. speed; abt. 600 gro tons, 2 comp engines, 3500 I H P.; 4 W.T. boilers; keel Feb. 8/26; launched Sept. 29/26. **delivered Feb. 15/27.**

Meitowax, hull 768, tugboat for **Long Island** Railroad Co.; 108' L.O.A.; 26' beam; **13'2" molded** depth; diesel-electric propulsion; keel June 16/26; launched Nov. 27/26; deliver March 5/27 est.

Hull 769, grain elevator for International Elevating Co.; 130 L.O.A.; 35 beam; 9 loaded draft forward 11 loaded draft aft.; diesel engs.; keel Sept. 30/26; launched Jan. 27; deliver Apr. 15/27 est.

Hull 771, steel caisson for Mid-Hudson Bridge; deliver Mar. 31/27 est.

Hull 772, steel caisson for Mid-Hudson Bridge; deliver Mar. 31/27 est.

Not named, hull 774, steam tug for Standard Transportation Co.; 100 ft. 2 in. L. B.P.; 24ft. 1in. beam; 12ft. 3in. depth; 15 knots speed; comp. engs. 850 I.H.P.; 1 Scotch boiler 14ft. 9in. dia. by 12ft.; deliver Aug./27 est.; keel Mar. 9/27 est.

Not named, hull 775, steam tug, sister to above; keel Mar. 9/27 est.

SUN SHIPBUILDING COMPANY

Chester, Penn.

Purchasing Agent: H. W. Scott.

Hull 98, hydraulic dredge for American Dredging Co.; 110x31'10"x10'; keel Aug. 10/26; **launched** Jan. 4/27; **delivered Feb. 14/27.**

Gulfspray, hull 101, twin screw motor tank barge for Gulf Refining Co.; 136'x27'x11'6"; 400 B.H.P. engs.; to carry 385 tons on 9' draft; 9 kts. speed; keel Dec. 2/26; **launched Feb. 12/27; delivered Mar. 5/27.**

Gulfsprite, hull 102, sister to above; keel Dec. 2/26; **launched Feb. 26/27.**

Not named, hull 103, twin screw motor tank barge for Tidewater Oil Co.; 252' long; 40' beam; 14' depth; to carry 1885 tons on 12' draft; 10 kts. speed; keel Jan. 3/27; launch Apr. 9/27 est.; deliver May 5/27 est.

Not named, hull 104, single screw bulk oil steamer for Tidewater Oil Co.; 480' long; 65'9" beam, 37 feet depth; to carry 13,000 tons on 27'6" draft; speed 12½ knots. 4250 I.H.P.; **keel Mar. 1/27.**

No name, hull 105, motor barge for Beacon Oil Co.

No name, hull 106, 13,000-ton motor tanker for Sun Oil Co.

No name, hull 107, tanker for California Petroleum Co.

TOLEDO SHIPBUILDING CO.

Toledo, Ohio.

Purchasing Agent: Otto Hall.

Wabash, hull 177, car ferry for Wabash Ry. Co.; 388 L.B.P.; 57'6" beam; 16' loaded draft; 13½ mi. speed; 2500 D.W.T.; T.E. engs.; 2500 I.H.P.; 4 Scotch boilers, 14'6" diam.; keel Nov. /26; launch Mar. 19/27 est ; deliver Apr. /27 est.

B. F. Affleck, freighter, hull 178, for Pittsburgh Steamship Co.; 580 L.B.P.; 60' beam; 19' loaded draft; 12½ mi. speed; 12,500 D.W.T.; T.E. engs.; 2500 I.H.P.; 3 Scotch boilers; 14' diam.; **keel Feb. 1/27.**

TODD DRYDOCK & ENGINEERING REPAIR CORP.

Brooklyn, N. Y.

Purchasing Agent: H. J. Shannon.

No name, hull 40, diesel-electric ferryboat for Dept. of Plant & Structures, City of New York; 101 ft. 6 in. length over guards; 27 ft. 7 in. beam; 6 ft. 8¾ in. loaded draft; 300 I.H.P. Nelseco diesel engine.

No name, hull 41, diesel-electric ferryboat, sister to above.

THE CHARLES WARD ENGINEERING WORKS

Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Hull 53, steel barge for W. C. Kelly Barge Line; keel Sept. 30/26; launched Dec. 22/26; **delivered Feb. 7/27.**

Hull 54, same as above, keel Sept. 29/26; **launched Feb. 19/27.**

Hull 55, same as above; keel Jan. 3/27.

Hull 56, same as above.

Hull 57, same as above.

Hull 58, same as above.

Hull 59, same as above.

W. A. Shepard, hull 60, towboat for W. C. Kelly Barge Line; screw propeller, 2 Fairbanks-Morse diesel engs.; 720 B.H.P.; keel Sept. 23/26; launched Jan. 11/27; deliver Mar. 15/27 est.

Duncan Bruce, hull 61, stern-wheel towboat, for W. C. **Kelly Barge Line; 135'x35'x6'; Fairbanks-**Morse diesel engs.; keel Jan. 17/27; launch Apr. 30/27 est.

Not named, hull 62, diesel powered stern wheel survey boat for Mississippi River Comm , Dredging Dist., Memphis, Tenn ; 139'6"x24'x5'3".

Repairs

ALBINA MARINE IRON WORKS,

Portland, Ore.

Purchasing Agent: John W. West.

Made and installed a new stern frame to the Shipping Board freighter West O'Rowa.

BETHLEHEM SHIPBUILDING CORP., UNION PLANT

Convert vessel into double-ended ferry City of Sacramento. Drydock, paint, misc. repairs: stmrs. Makaweli, K. R. Kingsbury, President Van Buren, Iowan, U.S.S. Oklahoma, U.S.S. Nevada, President Cleveland, R. J. Hanna, Edna Christenson, Glendale, Floridian, President Hayes, Rose City, President Pierce, Roxen, Carlos, Arizonan, Silverpine, Los Angeles, m.s. Lio, Tosca, Wm. Donovan, Ontariolite, barges Shell Nos. 5 and 6, Pan American No. 2, Union No. 1922, Calif. Pet. No. 1, tug A. G. Wells. Propeller repairs: stmr. Mojave, Willpolo, President Pierce. Install wildcats on windlass: stmr. Edna, barge Martinez. Engine repairs: stmrs. Dakotan, Tulsagas, Kentuckian, Waitemata, m.s. Tosca, barge Midway, stmrs. Newport, William H. Doheny, Charles G. Black, S. M. Spalding. Repairs to steering gear: Axtel J. Byles, Emidio. Pipe repairs: Java Arrow, Wilkeno, Edna. Misc. repairs: stmrs. Hawaiian, Mericos H. Whittier, Bolivar, Edna, Paul H. Harwood, Monticello, F. H. Hillman, Lebec, Sunelseco, Mongolia, Columbian, Eurana, Maunganui, Gulfstate, U.S.A.T. Kenowis, Willkeno, Manoa, Sudurco, Providencia, District of Columbia, Suelco, Montana, Dakotan, A. L. Kent, Willboro, Admiral Dewey, J. C. Fitzsimmons, Maunawili, Mexican, Surailco, McKittrick, John C. Kirpatrick, Claremont, Mary E. Moore, J. B. Stetson, Myrian, Mirlo, Nora, Harvard, Coalinga, San Gerardo, Phoenix, San Florentino, Standard, Sudurco, Utacarbon, Ampetco, Caddopeak, San Nazario, Suscolanco, m.s. Canadolite, Knute Nelson, Richlube, Missourian, ferry Chas. Van Damme.

CHARLESTON DRY DOCK AND MACHINERY CO.,

Charleston, S. C.

Drydocked and repairs: stmrs. Magmeric, Oak Springs, Eastern Victor. Misc. repairs on marine railway: tugs Mars, Brunswick, dredge J. M. Milliken, U. S. tender Cypress, ferry stmr. Palmetto, launch C. P. Dey.

GENERAL ENGINEERING AND DRY DOCK COMPANY,

Alameda, Calif.

Drydock, clean, paint, misc. repairs: tugs Arabs, Mariner, yacht Navigator (no repairs), barge Fruto, ferry City of San Rafael, stmr. Stanwood (also changed wheels), Helen P. Drew, Corrales, Clinton pile driver (renew sheathing). Drydock, partial paint, misc. repairs: ferry City of Richmond. Remove mast, installed new mast and booms, removed bill boards, caulked and reinstalled: stmr. Shasta. Docked, misc. repairs: Harbor Barge Co.'s House Barge. General damage repairs, dry docked: Crowley Barge No. 72. Vessels listed last month, but still undergoing repairs: stmrs. Elizabeth, Phyllis, g.s. Elia, ferryboat Harry E. Speas, yacht Bergana.

J. C. JOHNSON'S SHIPYARD

Port Blakely, Wash.

Repairs to vessels Nora, Minnie B., Laida.

THE MOORE DRY DOCK COMPANY,

Oakland, Calif.

Drydock, clean paint, misc. repairs: stmrs. San Pablo, Diana Dollar, Hayward, Santa Monica, Tiverton, Pacific Fir, Eureka, Crockett, U. S. A. T. Somme. Drydock, clean, paint, misc. hull repairs: stmr. Stanley Dollar. Drydock, clean, paint, misc. eng. dept. repairs: Pulpit Point, Borgestead. Drydock, clean, paint, misc. engine and deck repairs: Wellesley. Drydock, rudder repairs: U.S. Col. Geo. Armistead Engine dept. repairs: Tacoma. Wilhelmina. Eng. & Steward depart. repairs: Pawlet. Tail shaft repairs: Providencia. Misc. repairs: U.S.C.G. cutter Bear, San Ubaldo, Manulani, Margaret Dollar, San Manuel, Lake Frances, Maunawili, Hercules, Anne Hanify, Van Buren, West Mahwah, Tiverton

U. S. NAVY YARD,

Bremerton, Wash.

Misc. repairs and docking: Pennsylvania, Idaho, Stoddert, Paul Hamilton, Thompson. Misc. repairs incidental to operation as district craft: Mahopac, Swallow, Challenge, Pawtucket, Sotoyomo, Tatnuck.

PRINCE RUPERT DRY DOCK AND SHIPYARD,

Prince Rupert, B.C.

Docked, clean, paint, bow remodeled, propeller blades removed and faired, hull repairs: stmr. Prince Charles Docked, clean, paint, misc. hull and machinery repairs: 12 fishing boats. Misc. hull and machinery repairs: 23 fishing boats, 88 other commercial jobs.

TODD DRY DOCKS, INC.,

Harbor Island, Seattle, Wash.

Annual overhaul, retubing boilers, etc: H. F. Alexander. General overhaul: Redbird. Dock, clean, paint: stmr. Depere, Derblay, Wheatland Montana. Engine room repairs: Dorothy Alexander. Manufacture tailshaft, etc.: Edmore. Misc. repairs: Admiral Evans, Admiral Rodman, Admiral Rogers, Condor, Capac, Coya, Corsicana, Denali, Eemdyk, President Grant, President Madison, Ruth Alexander, Lena Luckenbach.

VICTORIA MACHINERY DEPOT CO., LTD.,

Engine repairs: stmr. Blue. Deck and stack repair., boiler repairs: stmr. Princess Ena. Deck and hull repairs: stmrs. Black, White. Built and installed 20 oil storage tanks, 170,000 gals. capacity; alteration and repairs to interior of vessel: stmr. Nootka Made and fitted new smoke stack tug Nanoose

Pacific Trade and Traffic

Pacific Coast Foreign Trade

THE foreign trade of the Pacific Coast customs districts in 1926 passed the billion-dollar mark for the first time since 1919, when the post-war boom sent values skyrocketing. Last year's combined export and import values, amounting to $1,064,922,092, actually exceeded those of 1919 by $2,784,645, and at the same time established a coast foreign trade record that has never been equalled in any normal or abnormal year.

The 1926 values were more than twice as great as in 1921, the year of the post-war collapse in foreign trade, and more than $110,000,000 in excess of those in 1925. The share of the Pacific customs districts in the national foreign commerce of 1926 was 11.63 per cent greater than ever before.

The Pacific customs districts, which include the states of California, Washington and Oregon, and the territories of Alaska and Hawaii, had an aggregate export trade of $518,877,198, an increase of $91,401,988, or 21 per cent over 1925, and an aggregate import trade of $546,044,894, an increase of $18,075,733, or 3.4 per cent over 1925.

California Leads

The foreign trade of the two California districts—San Francisco and Los Angeles—amounted to $550,069,956, an increase of more than $46,000,000 over 1925, and was $35,000,000 more than the combined trade of all the other customs districts in the Pacific area. California likewise continued to maintain its export supremacy in the Pacific district, the export values for the year under review being $290,416,924, an increase of $28,280,323, or 10 per cent over 1925; and Washington retained its dominant posi tion as the principal importing center of the coast, chiefly because of a large part of the Japanese raw silk shipments to the United States enter the country through the port of Seattle. Washington's foreign trade totaled $409,449,582, as compared with $382,431,364 in 1925, a value increase of $27,018,218, or 7 per cent.

Alaska alone of the six customs districts in the Pacific territory did not show an increase in exports and imports. The greatest gain in the export trade was made by Oregon, whose foreign shipments increased 87 per cent—from $41,934,504 in 1925 to $78,484,324 in 1926. Los Angeles exports increased 30 per cent—from $78,944,307 in 1925 to $103,291,358 in 1926. Exports from Washington, amounting to $147,569,990, showed an increase of 22 per cent over the preceding year, and San Francisco exports increased from $183,292,294 in 1925 to $187,125,566 in 1926, a gain of two per cent. Hawaiian exports, totaling $1,884,079 for the year, increased $39,297, or two per cent over 1926, but its imports of $10,829,509 decreased five per cent from the value of the 1925 figures. The Alaskan export and import trade, which never has bulked large in volume or value in the country's foreign commerce, totaled respectively $521,881 and $543,683, and decreased respectively 42 per cent and 35 per cent from 1925.

The greatest percentage increase in imports of the region occurred at Los Angeles where the value of the incoming foreign merchandise was 11 per cent — $5,011,929 — higher than in 1925. Imports into Los Angeles in 1926 amounted to $49,565,289, as compared with $44,553,360 in the previous year. San Francisco's import gain was 6.8 per cent, the values increasing from $196,536,614 in 1925 to $210,087,743 last year. Washington imports of $261,879,592 were virtually equal to those of 1925, which they exceeded by $5,708.

Among the several customs districts of the United States, those of the Pacific Coast made the greatest percentage gain in the 1926 export trade. The increase over 1925 was 21 per cent. The next largesp export gain was made by Gulf Coast districts, which increased 13.5 per cent. The North Atlantic district, through which passes the greatest volume of the country's foreign trade, had roundly 50 per cent of the nation's total export and import values last year; there was a decrease of 7.3 per cent in its export trade, but its imports increased 4.5 per cent.

In the aggregate, the foreign trade of the Pacific Coast area, a comparison of the value of the total exports and imports of the fiscal year ended June 30, 1913, with the total exports and imports of the calendar year 1926, shows an increase of $789,170,559 or 286 per cent. The value of the nation's foreign trade in 1926, as compared with the fiscal year 1913, shows an increase of 115 per cent, demonstrating that the growth of the commerce of the Pacific districts has been very much greater than the foreign trade of the country as a whole.

Foreign Trade Tonnage

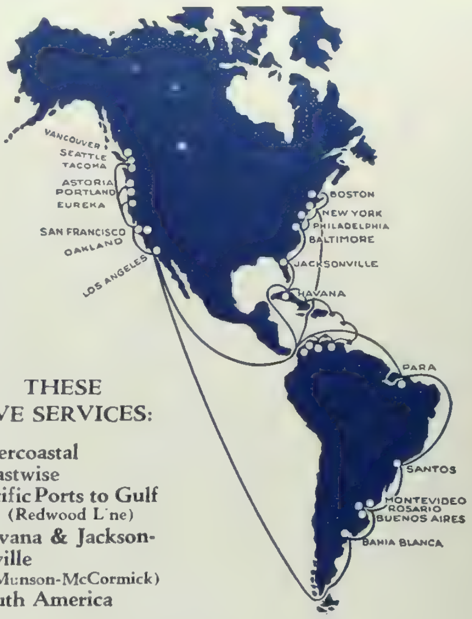
THE quantitative growth of American foreign trade in recent years is shown in a report of the Shipping Board representing our trade during the fiscal year 1926 as 1,174,000 long tons greater than it was during the preceding twelve-month period. The total cargoes of our water-borne foreign commerce during the most recent fiscal year amounted to 94,183,000 long tons. The report, which was developed by the Bureau of Research, under the direction of Commissioner P. S. Teller, indicates a sharp increase in the demand for imported raw materials for manufacture in this country. Due largely to this situation, our total imports advanced 2,553,000 tons, as compared with the preceding fiscal year, to an aggregate of 43,589,000 tons. Exports, on the contrary, largely because of a poor wheat crop, showed a decline of 1,379,000 tons, and a total of 50,593,000 tons for the fiscal year.

Conditions in our markets in Europe contributed largely to these changes. In 1926 our exports to Atlantic and Mediterranean Europe amounted to about 22,230,000 tons, a decline of 2,470,000 tons in comparison with shipments to these regions in 1925. The 1926 imports received from Europe were nearly 2,000,000 tons, 25 per cent greater than the 7,700,000 tons received in 1925. The only other region showing a decline in exports is Mexico, this change being a logical complement of the fall in Mexican oil imports. Asia and the Far East took nearly 800,000 tons more of American products in 1926 than in 1925; exports to South America increased 440,000 tons, and the export trade

A Mighty Pageant of Progress at our Doors

The first annual Pacific Foreign Trade and Travel Exposition, to be staged at the Civic Auditorium, San Francisco, June 6th to 12th, under auspices of the Foreign Trade Club of California, will reveal the giant strides made during the past few years in our foreign commerce.

In this development the McCormick Steamship Company is keeping fully abreast of the demands of discriminating shippers for service and efficient handling of cargoes between Pacific ports and the Atlantic seaboard, the Gulf, Havana, and Jacksonville, and South America. Our cooperation for success of the Exposition is pledged.



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†S.S. Ecuador	Apr. 2	Apr. 4	†S.S. Venezuela	Apr. 16	Apr. 26
*S.S. Corinto	Apr. 16		*M.S. City of S.F.		Apr. 15
†S.S. Colombia	Apr. 30	May 2	†S.S. Ecuador	May 7	May 17
*M.S. City of Panama	May 7	May 9	*S.S. Corinto		May 14
†S.S. Venezuela	May 21	May 23	*M.S. City of Panama		May 27

*Ports of Call—Mazatlan, Champerico, San Jose de Guatemala, Acajutla, La Libertad, La Union, Amapala, Corinto, San Juan del Sur, Puntarenas, Balboa and Cristobal.

†Ports of call—Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal and (Havana eastbound only), Cartagena and Puerto Colombia (Westbound only), and New York.

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with Central America and the West Indies increased 213,000 tons.

The tanker traffic, although of less general interest than the dry cargo trade, includes about 24 per cent of the total cargo tonnage movement involved in our water borne foreign commerce and its fluctuations materially affect the traffic totals as expressed in tons. For instance, in 1926 the tonnage of dry cargo imports exceeded 32,000,000 tons, an increase of nearly 4,684,000 tons over 1925, but a decrease of 2,131,000 tons in tanker imports, due to the decline in Mexican oil movement, reduced the total import increase to the 2,553,000 tons mentioned.
hand, the 1926 dry cargo export total of approximately 39,000,000 tons was 1,698,000 tons less than the previous year, but the increasing development of domestic oil supplies was sufficient to permit tanker exports approximately 319,000 tons greater than in 1925, thus reducing the total export loss to 1,379,000 tons.

Pacific Port Construction Notes

Santa Barbara. A. J. Grier, of Santa Barbara has been awarded a contract by the city council for the construction of a 1200-foot rubble mound breakwater on a bid of $380,800. The huge rock slabs to be used in this work will be taken from the solid rock cliffs of Santa Cruz Island.

A number of citizens of Santa Barbara, including several prominent engineers, were in favor of caisson construction for this breakwater, but the city council decided in favor of the rubble mound type of construction due to the fact that caisson construction has never been tested in the open sea in Pacific Coast port work.

* * *

Stockton. While the last Congress authorized the construction of a deep water ship canal from San Francisco Bay to Stockton, the necessary funds have not been appropriated. Therefore the City Council has authorized the advancement of $27,000 to the U. S. Army Engineers for preliminary survey. The channel will be 300 feet wide and 26 feet deep.

A number of Stockton citizens recently made an excursion to Houston, Texas, to study the deep water ship canal so successfully operated at that port. The project will cost about $5,407,500. Stockton will provide $3,000,000 as its share of the cost, a bond issue for this purpose having been approved in 1925. Bonds will not be sold until the federal appropriation has been made.

* * *

Newport Beach. The citizens of Newport Beach recently approved a bond issue of $500,000 for the improvement of the entrance to Newport Harbor by the construction of two jetties. The one on the west will be 2100 feet long and the one on the east of the entrance will be 1500 feet long. They will be 800 feet apart.

* * *

Martinez. Bids were called March 4 by A. W. Pioda, San Francisco reclamation engineer, for the reclamation of 50 acres of municipally owned waterfront. The California Transportation Company and the McNear Company, owners of adjoining 30 acres, have authorized Mr. Pioda to receive bids for the reclamation of their land, the work on both projects to be done by one company.

* * *

Alameda. Work will start soon on the extension of the belt line railroad of Alameda through the industrial district from its present terminal near the Alaska 'Packers' Association to the foot of Morton Street. Construction will also be undertaken of a freight ferry terminal. The entire expansion of the belt railway facilities will approximate $1,000,000, according to a report made by Councilman Al Latham, who represents the city of Alameda on the board of management of the belt line.

* * *

Honolulu. The Hawaiian Dredging Company was the sole bidder for the construction of the first pier to be built in Kapalama basin, into which a 100-foot channel has been dredged from the main harbor. Contract has been awarded to this company on their bid of $234,000, work to be completed in 200 days. The pier will be 308 feet in length and may be added to at some future date.

According to the Honolulu Advertiser, "Completion of the pier will mark the first movement of harbor traffic towards the large area known as Kapalama and Kalihi basins. It will tend to relieve the congestion on the ewa side of the harbor when the pineapple season is on, as it is the intention to dock pineapple barges at the Kapalama pier. The pineapple factories are located in that vicinity and there is ample room for the railroad to reach any docks constructed in that area. It is the intention, eventually to have freighters carrying cargo consigned to the pineaple factories to discharge in Kapalama.

"The United States engineers bureau in Washington has recommended a wider channel into Kapalama and a dredged area that will provide Honolulu with greatly increased harbor facilities."

Merritt, Chapman & Scott, Los Angeles, have a contract from the city of Honolulu for the laying of

Piers 8, 9, 10, and 11 at Honolulu Harbor, with the Aloha tow at the background. The new Matson liner Malolo will dock at these piers.

a sewer outfall in the ocean, which will necessitate the employment of divers. Work will cost $450,000.

* * *

Final details of contracts to the Hawaiian Dredging Company and the Union Dredge Company of Honolulu for dredging Pearl Harbor have been arranged and the contracts signed. The Hawaiian Dredging Company's contract is for dredging Pearl Harbor and its entrance to the Navy Yard drydock, at a cost of $3,000,000. The Union Dredge Company will deepen Pearl Harbor around Fort Island at a cost of $1,500,000. Work will begin shortly.

* * *

Portland. A new terminal is to be built at Portland on the site of the old North Pacific mill, which adjoins the Willamette Iron and Steel Works on the North. Work on the first unit will be started this spring. The new terminal will be known as the Elrod-Trimble docks and will be erected by J. O. Elrod of Portland and J. H. Trimble and others of Indianapolis. The tract includes 101 acres and has a frontage on the river of three-quarters of a mile.

At first two slips are to be provided, each 200 feet wide and 550 feet long. The length of the dock between the slips will be 546 feet, on which will be warehouse and transit sheds, as well as refrigerated storage for fresh apples and other perishables. Adequate trackage connections will be provided. The terminal will have abundant deep water, and plans are being drawn that provide for all modern facilities for the handling of cargo, including direct transfer between cars and vessels. The adjacent area will be laid out in industrial sites. The terminal will cost about $2,000,000.

* * *

The Port of Portland Commission will put on the market about the middle of May $600,000 worth of bonds, returns from which will be used for the completion of existing projects, including the dredging program for the remainder of the year, construction of a dike or causeway from the head of Swan Island to the East Shore, and removing obstructions in the lower part of the harbor.

* * *

Olympia, Wn. The Board of Commissioners of the Olympia Port District on March 8 opened bids for the construction of a 624-foot extension to the port dock, 104 feet wide. The three lowest bids were those of T. E. Jones, Seattle, for $53,506.47; Paul S. Savage, Tacoma, $54,153.83; and the Hart Construction Co., Tacoma, $54,397.90.

* * *

Seattle. The Seattle Port Commission, under George B. Lamping, president, is planning the enlargement of the grain elevator at the Hanford Street terminal from 1,000,000 to 1,500,000 bushels' capacity. This port is also drawing up plans for the construction of a modern steamship and industrial terminal on the site of the former Skinner & Eddy shipyard.

* * *

Alaska. Only one bid for widening and deepening Wrangell Narrows in Alaska was received in response to request for bids sent out by Major L. E. Oliver, of the Army Engineers Corps at San Francisco. The bid was submitted by the Puget Sound Bridge and Dredging Company of Seattle, asking $206,309.50 for the work. The bid has been submitted to the War Department at Washington.

The New Ship Radio Beacon

(Continued from Page 163)

the beacon aerial provides a good loud signal in a standard Kolster radio compass inside the desired zone of from ten to twelve miles. The desired radiation is easily obtained by the proper length of aerial and is done by the installers and not again changed.

When once installed, the ship radio beacon is very easy to operate and requires very little attention. An occasional drop of oil on the transmitter mechanism and motor bearings is about all it requires.

Although the Kolster radio beacon has been designed for use on board ship it can also be used as a secondary shore beacon at harbor entrances, on small islands inside harbors, and on piers. The signal transmitted can be different in each case. For instance, at a harbor entrance the beacon on one side could transmit a dot and a dash, the Morse letter "A," and the beacon on the other side could transmit an entirely dissimilar group such as the letter "B," one dash and three dots, sent very slowly so that any navigator could easily identify it. A leading mark inside the bay could transmit still another character and a dock still another and inasmuch as the range of each beacon can be controlled from zero to maximum, so that a dock beacon could have a range of one mile or less if required, there is every good reason to believe that a vessel equipped with a radio compass could find her way into a fogbound harbor and right up to dock by means of radio compass bearings.

A license to operate the new radio beacon as a shore beacon on 850 meters would of course have to be obtained from the Department of Commerce, but a new aid to navigation which makes for safety of lives and property, as well as the saving of time and money, ought to be given a lot of favorable consideration.

STETTINIUS HONORED

W. C. Stettinius, president of the American Hammered Piston Ring Co. of Baltimore, has been appointed a member of the merchandising committee of the Automotive Equipment Association, filling the vacancy caused by the resignation of T. H. Quinn of the National Lamp Works of the General Electric Co.

Mr. Stettinius at the present time is President of the N. S. P. A., having been elected to that office at the Association's meeting last November, and has also in the past served on the Service Parts Committee of the A. E. A.

DOUBLE SEAL PISTON RINGS

D. D. Cook, San Francisco branch manager of the Double Seal Piston Ring Company, announces the appointment of the firm of Hough & Egbert, Inc., as associate distributors for Double Seal piston rings to the San Francisco marine trade.

Discussing the product, Mr. Cook said, "Double Seals have had their greatest popularity among diesel engine manufacturers and diesel engine operators and render the same satisfactory service for steam installations. This ring is the only ring on the market actually holding 100 per cent pressure in worn or tapered cylinders, saving engine operators the expensive operation of reboring worn cylinders to get full efficiency from their equipment."

Hall-Scott Heavy Duty Marine Motors

(Continued from Page 183)

Cruiser Lorelei, owned by Colonel E. J. Hall, Berkeley, California, powered with Hall Scott H. S. R-6 marine engine.

and motor bus operation. The same connecting rod is used on both the 4 and 6 cylinder H. S. M. Type, the 4 and 6 cylinder H. S. R. Type, and on the 4 and 6 cylinder bus engines.

Looking around the shops at Berkeley was a pleasure to the practical engineer. All possible modern machines and measures to insure absolute exactness in the finished job were noted. The shops are being added to rapidly and will soon cover three city blocks. A new addition now going up will give 26,000 square feet of additional floor space. Conveyors, heat treating ovens, individual electric drive for the machines, testing blocks, and all the usual adjuncts of a modern shop are there. The workmen all appear to be well satisfied. A high average of typical American skilled mechanics was noticeable. The firm believes in treating good men right, and labor difficulties have never marred the spirit of this shop. A day's work is the rule, the company finding that piece work is not the best way to produce finished exactitude in building engines.

During the past year over 250 sets of engines were built for marine work, including 125 high speed jobs for the Sea Sled Company, of West Mystic, Connecticut, and 35 large units for Fageol motor buses. Looking over different products of the shops, the smaller details of good finish were observed. All studs are made to exact lengths and to give one thread through the nuts.

One fine feature of the building of this engine is that all castings of bronze, aluminum, or iron are made in California. The only parts brought in are the steel drop forgings. Later the firm intends to make these also. Speaking of forgings, the crank shafts of all engines are of a very special sort. Tough and close grained, they average a hardness of 50 (Brinell) and are consequently all ground to size after being roughed to an eighth inch over.

Many good features in design are peculiar to the Hall-Scott engine, one of them being the single cam arrangement, by which inlet and exhaust overhead valves are operated. The cooling water channels are so arranged and fitted with ports that mud and deposits can readily be washed out. Oil filters of an exceptionally good type are part of the engine, and with little attention all oil is kept clean and free of carbon. Aluminum is extensively used in the frame and crank case, giving lightness and rigidity. Another feature of particular note on the workboat engine job is that reversing does not reduce the efficiency of the propeller. This has been worked out after much research and careful design and is something that marine users will appreciate. Plenty of generator power is provided, so that current supply for many lamps is given. Starting current is ample for rapid get away. In fact the whole unit is practically complete and perfect. To those interested in the type of engine described, a trip to the Berkeley factory at Fifth and Snyder Streets will well repay the trouble.

Lately the business has been consolidated with the American Car and Foundry Company, insuring large capital and far flung branches. It is understood that something entirely new in gas engine propulsion will soon be turned out fro mthe factory, as the result of experimental work now going forward.

The heavy duty 6-cylinder 175-horsepower Hall-Scott motor is being used largely in heavy cruiser type tow boats and launches. This engine will swing a 44-inch diameter wheel with the proper pitch. Some 20 of these motors have been sold since the first of this year.

The cruiser yacht Sueja III. of Seattle, as snapped by Pacific Marine Review staff photographer at Pier 23, San Francisco. This fine seagoing yacht is equipped with Washington-Estep diesel engines built and installed by the Washington Iron Works of Seattle.

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Novel Light Weight Diesel

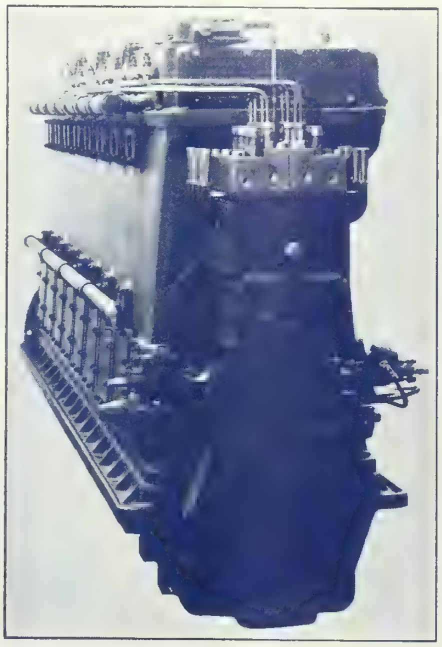
(Continued from Page 180)

sults in a very neat arrangement with shorter lifts, lighter springs, and less wear on cams. At the level of the head of the main frame which houses the entire unit, a recess in the casting provides the air inlet manifold. Consequently the air inlet valves are located in the head adjacent to the front side of the engine. Passage way through the main frame at the back of the engine is provided for the exhaust gases to enter the exhaust header. Valve operation is controlled by a camshaft running the full length of the engine at the level of the cylinder head, the camshaft being driven by a silent chain drive direct from the crankshaft. The whole valve and head arrangement is very simple and accessible, it being so arranged that any of the valves or valve levers proper may be removed without disturbing any other part of the mechanism.

Pressure lubrication has the dual purpose of supplying lubricant and carrying away heat. In an oil engine operating with speeds as high as 900 revolutions per minute, the subject of bearings is an important one. In the Foos Type L engine the bearing beds or bases are bored with their caps in position, shims interposed. Babbitt is then poured against the tinned surfaces of the bronze back shells. All bearings are of ample area to insure safe unit stresses and cool running.

The cylinder liners are held in the upper base by an integral flange or collar, with rubber gaskets above and below to prevent water leakage. The liner takes explosive pressure and rod and piston thrust and, while of thin section to readily transfer heat, has all the strength necessary to withstand the high internal pressures.

The piston is of cast iron lubricated by the mist from revolving parts, there being no reservoirs or oil cups to fill. The piston pin is hollow and is lubricated by a steel tube fixed in the connecting rod and fed from the main circulatory system. The upper end of the piston is concave to insure quick cold starting. The engine proper consists of two major castings, the upper half carrying cylinder liners, heads, etc., while the lower part houses the crank shaft and main bearings. Two longitudinal flanges run the full length of the lower half and serve to support the engine.



End view of Foos type L diesel engine, 8-cylinder size, 265 horsepower at 600 revolutions per minute.

The cam shaft is provided with two sets of cams — ahead and astern. For direct reversing, the shaft is operated laterally by air. For reversing in the smaller sizes, a marine type reverse gear is used. When desired, the unit can be arranged for opposite rotation desirable in twin-screw vessels.

The engine is unusually flexible and is easily controlled. All controls and valves are located at the governor end of the unit. For marine maneuvering, a manual speed control is provided and the engine can be made to throttle down to a very low minimum speed and pick up to full speed without jerking or slipping, in much the same manner as an automobile engine. However, when it is necessary to operate the engine at a reduced speed for any length of time it is advisable to set the governor.

The Foos Type L diesel engine is built in 2 to 8 cylinders with a bore and stroke of 8½ by 11 inches; the speed ranges from 300 to 900 revolutions per minute, giving a power rating range of 50 to 475 brake horsepower based on 70 pounds B. M. E. P. The engine weight complete ranges from 60 to 30 pounds per horsepower depending on the power and speed. A 200-horsepower Foos diesel can be placed in the same approximate space requirements as those required by other engines of 75 to 100 horsepower. For services requiring a clutch, the latter may be furnished built into the engine.

Refrigeration for Fishing Boats

(Continued from Page 185)

the only attendance necessary is the cutting in of a "Squared D" switch on the engine room bulkhead when refrigeration is required. As indicated above, the installation on the President is similar but of less capacity. The Lipman self-contained refrigeration unit is driven on this boat by a gas engine through belt drive.

The Lipman self-contained automatic refrigeration machine is manufactured by the General Refrigeration Company of Beloit, Wisconsin. This company is ably represented on the Pacific Coast by the Power Plant Engineering Company at Seattle, Portland, and Tacoma; the Price-Teltz Company at San Francisco; the General Refrigeration Company of Southern California at Los Angeles; and the West Coast Gas Engine Company at San Diego.

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March 19th, 1927.

THE following steamers are reported fixed with grain to the U. K.-Continent: British steamer Epson, 40/-, prompt, Canadian Cooperative Wheat Producers; British steamer Elmworth, 38/9, option British Columbia, 37/6, April, Kerr Gifford & Company; Japanese steamer ("K" line), 37/6, April, Canadian Cooperative Wheat Producers; British steamer Kurdistan, April, Canadian American Shipping Company; British steamer Otterpool, 36/3, April, Canadian Cooperative Wheat Producers; Japanese steamer Kofuku Maru, 37/3, April, same charterers; British steamer Indian City, 37/9, March April; Japanese steamer, British Columbia to Portugal, 38/-, April, Wilmer Grain Company; British steamer Madras City, 37/9, April May; British steamer Benmacdhui, 38/6, April, Kerr Gifford and Company; British steamer Middlemoor, March, Balfour Guthrie and Company; Japanese steamer Yuri Maru, British Columbia to Portugal, 38/-, April; British steamer Bencleuch, lump sum, April/May, Canadian American Shipping Company.

The Japanese steamer Yonan Maru is reported fixed from British Columbia to Shanghai with grain, March/April loading, by Canadian Cooperative Wheat Producers.

The following lumber fixtures to Australia are reported: American schooner Ella A, Puget Sound to Australia, April, J. J. Moore & Company; American schooner Elinor H., same; British steamer Myrtlebank, North Pacific to Australia, $15, May Loading, same charterers.

The following steamers are reported fixed with lumber to the Orient: Japanese steamer, 1 port North Pacific to 1 port Japan, $10.50, April; Japanese steamer, same, $10.75, March/April; Japanese steamer Ohkuni Maru, two ports North Pacific to two ports Japan, $9.75, March loading; Japanese steamer Boston Maru, Puget Sound and Grays Harbor to three ports Japan, Nakagawa & Campany; Japanese steamer ("K" line), Columbia River to Japan, April, Pacific Export Lumber Company.

The American steamer Brookings is reported fixed from the North Pacific to Callao with lumber, $14, March loading, by W. R. Grace & Company.

The following lumber fixtures to the Atlantic are reported: American steamer Commercial Traveler, Puget Sound or Grays Harbor to New York, March, C. R. McCormick Lumber Company; American steamer Lake Benbow, Puget Sound to New York, April; Japanese steamer Gyokoh Maru, British Columbia to New York and Boston, April; American steamer Oneida, Grays Harbor to New York, $14.75, April, Krauss Brothers; British steamer Salmonpool, British Columbia to Montreal, lump sum, April, Canadian Transport Company.

The British steamer Paris City is reported fixed with lumber from the North Pacific to South Africa, $24.50, March loading, by J. J. Moore & Company, Inc.

The American tanker Atlantic Sun is reported fixed from California to North of Hatteras, 5 trips, clean, March.

The following vessels are reported taken on time charter: British steamer Esther Dollar, 1 round trip, San Francisco to Australia, 95 cents, April/May, J. J. Moore & Company, Inc.; Norwegian tanker O. A. Knudsen, general trade, 1 year, delivery Pt. San Luis, February, Union S. S. Company; British steamer Chelsea, 6 months Pacific trade, delivery Vancouver, redelivery Japan, $1.10, Canadian Transport Company; British steamer British Monarch, Pacific trade, same charterers; Norwegian steamer Rigi, North Pacific to Australia, delivery Colon, April, $1.55, American Trading Company.

The following steamers are reported sold: American steamer Chillicothe, Columbia River Packers Association to J. J. Moore & Company; American steamer Humboldt, $28,000, U. S. Marshal to Albert E. Gillespie; American steamer San Juan, $20,500, U. S. Marshal to Albert E. Gillespie; American steamer Santiam, Hammond Lumber Company to Sudden & Christenson; American steamer San Antonio, $5250, U. S. Marshal to George Wisebaum; American barkentine Centennial, Alaska Packers Association to Captain Frank Weidemann; American steamer Cleone, $3000, U. S. Marshal to George Wisebaum; American steamer American Star, U. S. Shipping Board to Nelson S. S. Company; American steamer Milwaukee Bridge, U. S. Shipping Board to Matson Navigation Company.

PAGE BROTHERS, Brokers.

Shipping Board Competition

AVERAGE cargoes carried in Shipping Board vessels are considerably larger than those carried in either independent American or foreign vessels engaged in the foreign trade of the United States, according to a report on dry cargoes carried in the fiscal year 1926 which has just been completed by the Shipping Board Bureau of Research.

The average load carried by Shipping Board vessels, the report showed, was 3351 long tons, while independent American dry cargo carriers carried loads averaging 1716 tons and foreign flag vessels sailing to and from our ports carried 2250 tons. Shipping Board vessels, however, are of greater size than either of the other two classes noted. They average 8942 deadweight tons, while the independent American ships average 3398 tons and the foreign-flag vessels 4269 tons. The average deadweight tonnage of all general cargo ships touching American ports during the period considered was 4220 tons.

About 29 per cent of all the ships employed in the transportation of the water borne foreign commerce of the United States travel empty, the report indicated. During the fiscal year a total of 23,400 dry cargo carriers arrived at American ports. Of this number 6869 brought no cargo. Almost an equal number departed without cargo. It is further noted that this fleet of 23,400 vessels having a carrying capacity of approximately 80,000,000 long tons arrived with less than 32,000,000 tons of imports, 40 per cent of capacity, and carried out 39,400,000 tons of exports, or less than half a load.

It is evident from the above Shipping Board report that both the American and the foreign flag privately owned vessels are feeling Shipping Board competition.

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Bottom Repairs on Solana

(Continued from Page 169.)

ture, one place being 54 feet and another 24 feet long, the normal keel bearing of 380 feet was reduced to 302 feet. The bilge blocks used were both set and pulled. These supported the bilges for approximately 204 feet. Owing to bilges being out of fair and some of the blocks receiving greater weight than others, the bilge blocks were constructed on the ply system, extra solid.

After the vessel had landed on keel and set blocks throughout, extra solid blocks were drawn in to support the fining ends of bilges. As soon as the deck of the dock emerged from water, blocks were fitted under the keel where crushed; also under the bilges where the blocking did not fay against the unfair surfaces. Where undue weight was shown, extra sets of blocks were inserted immediately, and where keel blocks had to be cut out, shores were carefully fitted on both sides. The heads of these shores were held in place by clips with one flange shaped to fit the raised strake edge. These clips were welded to the shell. The location of every shore was on a bulkhead or transverse web. Blocks or shores were then inserted under every main transverse bulkhead, principally at their intersection with the deep side girder. In this way the structure was suspended, when necessary to cut away keel blocks on the transverse bulkheads. Between bulkheads the center structure needed additional support when keel blocks were out. This was accomplished by cutting away bottom shell plating and passing down through deck hatch 12 by 12 shores. These shores were fitted in the shape of an "A" frame with apex under main transverse under summer tank. A single extension piece was then fitted between the main transverse and deck transverse. As the athwartship bulkheads were 27 feet apart, these, together with the "A" frame, gave a rigid support every 13 feet 6 inches. Additional 14 by 14-inch by 12-feet long blocks were cribbed across the space between pontoons under the bilge to hold them in their relative positions.

The cutting away of damaged material was begun simultaneously at each end of the ship. The flat keel plate, "A" and "B" shell strakes, and lower strakes of centerline bulkhead, together with the adjacent steel necessary to release these plates, were cut away in sections not too long to weaken the vessel. New and faired centerline bulkhead plating, flat keel plate and keel angles were then replaced, closely bolted, but not riveted. Then the keel blocks were replaced and another section treated in the same manner, always working to the closing plate amidship.

Balancing the Pontoon Stresses

Immediately after docking the vessel for repairs, the sheer line of the deck was laid down from builders' offsets in the loft. From this line to a height above deck suited to a transit setup, a line parallel to the base line was run, and offsets marked on a batten from straight line to sheer line at every bulkhead. These offsets were taken at a distance off centerline to center of poop house doorway, as at this particular position a sight could be set up to the forecastle bulkhead. By setting transit in doorway, to the batten height at that bulkhead and drawing a bead on a line marked to batten height on forecastle bulkhead, heights at every bulkhead could be quickly read. Using this method, the vessel was found to be hogged 2¾ inches, with the highest point at bulkhead 24, which is amidship.

Then it became necessary to determine the pressure each pontoon was exerting on the vessel. This was made simple by figuring the weight of one pontoon, the water contained therein reduced to tons per inch, and the tons per inch of displacement.

The weight of the ship's structure was distributed over five pontoons, giving a support to each end at center and at each quarter of the vessel. The vessel's weight was figured per running foot together with blocking, shoring, and working equipment for each pontoon. Then by carefully reading freeboards at each corner of each pontoon and the depths of water inside, the action and re-action of pontoons and weights could be quickly calculated.

Each pontoon was balanced with the load it carried, and markers in feet and inches fixed at each corner of all pontoons for quick inspection.

Taking Out the Hog

As the vessel was hogged, it was necessary to take this out before the closing plate of centerline bulkhead and flat keel were in place; a gradual and increasing strain was set up day by day by letting in water in the center and quarter pontoons, or by pumping out the end pontoons. By this process the hog was gradually reduced over a period of 40 days to 1¼ inches. Of course the transit was set up to record the change in every instance.

At this stage of the work the steel workers had fitted the closing plate of centerline bulkhead and the double keel bars, well bolted but not riveted, and were ready to lift the closing plate of the flat keel. It became necessary to complete the straightening of the ship before proceeding further.

The specifications required new plating or plating to be taken off, faired, and returned, at the buckled sections amidship, extending from three strakes above the bilge strake on starboard side around the bottom to two strakes above the bilge on port side. All rivets above this section were specified to be renewed up through the sheer strake. So all butt and seam rivets, longitudinal and bracket rivets were cut out from two strakes above bilge in starboard around the bottom to the same height on port side adjacent to bulkhead 24, the buckled section. Every connection was carefully inspected to make sure nothing held. Considering the ship as a girder of "H" section her condition at middle of length was this:

> The upper flange or deck was intact; the lower flange or bottom shell was cut; the web or centerline bulkhead was intact, with bottom strake and keel bars well bolted. This flexible condition made it possible to complete the straightening of the vessel in one operation.

The transit was set up on deck with batten fixed at bulkhead 24, with pencil point in plane of transit showing 1¼-inch hog. The dockmaster was then ordered:

1st—Let water in pontoons Nos. 2, 3, 4 for three minutes. Result 1/16-inch correction.

2nd.—Let water in pontoons Nos. 2, 3, 4 for three minutes. Result ¼-inch correction.

3rd.—Let water in pontoons Nos. 2, 3, 4 for three minutes. Result ¾-inch correction.

4th—Let water in pontoon No. 3 for two minutes. Result 7/8-inch correction.

5th—Let water in pontoons Nos. 2, 3, 4 for two minutes. Result 1-inch correction.

6th—Let water in pontoon No. 3 for two minutes. Result 1½-inch correction.

The sight was then transferred to the keel showing ¼-inch sag. A slight sag was desired to set up a force to counteract the strain in centerline bulkhead and uncut side shell tending to hog the vessel. It will be noted that in a period of fifteen minutes results were obtained that would have taken a large and expensive force weeks to accomplish in a graving dock or on a marine railway.

The figures below show the condition of all pontoons just before the correction when a hog of 1¼ inches existed, and just after the vessel was straightened.

All weights are in tons.

Condition With 1¼-inch Hog.

Pont.	Freebd.	Draft	Displacement	Water in Pontoon	Weight of Pontoon	Upward Lift	Weights Carried	Difference
1	13.19″	153.81″	3460	168	1750	1542	1455	+87
2	13.87″	153.13″	3445	887	1750	808	913	—105
3	17.12″	149.88″	3372	1013	1750	609	755	—146
4	19.19″	147.81″	3326	931	1750	645	795	—150
5	18.37″	148.63″	3344	774	1750	820	506	+314
						4424	4424	0

Condition With ¼-inch Sag.

Pont.	Freebd.	Draft	Displacement.	Water in Pontoon	Weight of Pontoon	Upward Lift	Weights Carried	Difference
1	6.31	160.69	3616	197	1750	1669	1466	+203
2	4.56	162.44	3655	1097	1750	808	913	—105
3	6.50	160.50	3611	1597	1750	264	755	—491
4	8 87	158.13	3558	1084	1750	724	795	— 71
5	8.56	158.44	3565	845	1750	970	506	+464
						4435	4435	0

This strain was maintained throughout the remaining period of repairs, until the entire structure had been restored and the last rivet driven.

After the straightening operation, the daily readings were transferred to the keel and continued through the last dry-dock day. It will be interesting to note that on a bright sunshiny day the sag reduced to 1/16-inch, while on a cold rainy day it would increase to 7/8-inch, varying between these figures depending on the condition of the weather.

When the vessel, from a structural standpoint, had been completed, the strain was relieved. This happened on a warm day and a hog of 1/16-inch developed. However, the next day was cold and rainy so the reading showed 3/8-inch sag.

In the same manner tank testing, even to heading up four cargo tanks at one time, was compensated for without straining the vessel. The pontoons were manipulated to offset the added weights. The daily readings during this period proved the structure was not stressed at any time to an appreciable amount.

ERRATUM

All readers of acute vision and an analytical turn of mind will, of course, have noted in the Marine Insurance Section of the March issue of Pacific Marine Review, under subhead "The Willdomino Deviation," that a "causal" linotype operator, assisted by a "casual" proofreader and a careless editor, overlooked a faux pas sufficiently serious to provide ample "Causus Belli" among proctors in admiralty and underwriters along California Street.

See HAWAII

This Summer!

"The romance of a trip to the Hawaiian Islands really begins on shipboard," writes Captain Samuel E. Darby of New York, who sailed last July on the Matson liner Wilhelmina for Honolulu. "Acquaintances are quickly made and the passengers rapidly settle down into restful and peaceful enjoyment of freedom from care, tensed nerves relax, jaded brains take on fresh life, weary bodies reawaken, as the days pass by only too rapidly.

"A large part of the picture is the thrill, the charm, the enchantment that come over one when in the midst of all the beauties of nature, of rich coloring, of soft breezes and beautiful flowers which are to be found in the Islands in such glorious profusion. . . ."

A Matson liner leaves San Francisco every Wednesday for Honolulu, and every 42 days from Seattle. A Matson-Oceanic liner leaves San Francisco every 21 days for Hawaii, Samoa, Fiji and Australia.

This June the new Matson de luxe express liner MALOLO (Flying Fish) will be in service, carrying 650 passengers, all first-class, from San Francisco to Honolulu in 4½ days. She will be queen of the Matson fleet, the ships that serve Hawaii.

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Masters, Mates and Crew

TO draw hasty conclusions from isolated cases is always dangerous. The high character of the personnel composing the deck department of the modern ocean carrier is indicated in reverse ratio by the surprise registered in reading the following illustrations taken from a recent Marine Section, National Safety Council News Letter.

The first officer of a big freighter leaving New York for Australia via Cape of Good Hope recently said:

"Sailors and firemen have to be handled with gloves now and pampered as if they were hot-house plants. They have jam, marmalade, butter, pickles, two kinds of fresh meat at a meal, vegetables, ham and eggs twice a week for breakfast, fish, and oatmeal porridge with milk and other delicacies that were unheard of when I first went to sea thirty years ago. I can see the time coming when the chief officer of a liner addressing a sailor will have to say: 'Pardon me, Mr. Smith, but will you kindly step forward and request the gentleman who attends to the lamps to favor me with a few moments' conversation in my cabin. Do not disturb him, I pray you, if he is engaged, but let me know, and I will call upon him myself.'

"In my young days at sea we lived on salt horse and salt pork, with lots of hardtack and hard work," the chief officer continued, "and an onion was a luxury. The crews of the packet ships that made record passages across the Atlantic and to China round the Cape of Good Hope were fed on the roughest rations, but they were as hard as nails and could stay on deck forty-eight hours at a stretch. As the old saying went in describing a sailor of the sailing ship times, 'Every hair of his head a rope yarn, each finger a marlinspike, and every drop of blood in his body Stockholm tar.'

"Now the misfits that are sent to a ship to look for a job after every other chance ashore has gone, wear white shirts, smoke cigarettes, chew gum, and go before the consul to complain if they are asked to step up on deck for one watch when the work has to be done.

"Last voyage I had one young fellow who shipped as able seaman and did not know the difference between the forepeak and the lazarette, but he was an authority on Byron, the bo'sun told me, and read poetry to the men on their watch below. One day I told him to go on the foc'sle head and clear away some gear that had been left there by the previous watch on deck and he looked at me in a pained way and said, 'What—in this rain, sir?' When I recovered from my astonishment I made a run at him, and he went right away without further hesitation."

Quite in harmony with the foregoing, but dealing with mariners of higher rank—the masters themselves—is the recent criticism by Captain Fritz Kruse, commander of the Hapag liner Resolute, who brought his vessel to her pier in New York from Hamburg on the final day of the year. Captain Kruse was indignant at the action of the master of the British freighter Clearton, outward bound from Baltimore, in sending an "S O S" when his ship had only encountered a mishap to her rudder. Of course, as a result of the distress call, all broadcasting ashore and messages at sea instantly ceased.

According to the newspapers, the captain said: "It seems to me a violation of the "S O S" privilege to send out a call when there is not any actual danger to human life. I was 220 miles off when my operator picked up the call, the Berlin was 181 miles off, and the Olympic about 160 miles. When the captain of the Olympic offered to go to the Clearton's assistance if the crew wanted to be taken off, the captain of the freighter said that all he wanted was a tow because his rudder was gone. In my sailing ship days it was considered nothing, when a ship lost her rudder, for the skipper to rig up a jury rudder and bring his vessel into port. Today the younger captains seem to get hysterical."

Hands Across the Sea

THERE has been much criticism in British marine trade journals recently over sundry bills pending in Congress, and threats of retaliatory measures have been pungent and forceful. It is all the more delightful, therefore, amid this barrage of adverse comment, to discover now and then bits of amenity and the friendliness of the international mind. Here is a sample taken from Syren and Shipping of February 16.

"Those who navigate along the Oregon coast are well acquainted with the famous Tillamook Rock Light Station, which is located on an isolated rock about one mile from the shore in lat. 45.56 N. and long 124.1 W. The light is exhibited from a square white tower rising 64 feet from the summit of the rock, and the lantern is 132 feet above high-water mark, the flash of this friendly beacon, which is given once every five seconds, being visible 17 miles away. The light was established in 1881, and the present keeper has kept vigil there for 24 years. On a recent occasion when the station was short-handed he was 19 months without being relieved. His task must have been a trying one, for in addition to the "tedium vitae" from which a man suffers under such circumstances it should be remembered that the Pacific frequently belies its name, and its great rollers, sweeping landwards after traversing hundreds of miles of open ocean, sometimes completely engulf the light tower and wrench the stout plate glass from its window frames. It is pleasant, however, to know that these lonely light-keepers are a subject of solicitude to some kindly souls who appreciate the difficulties of their calling and do what they can to ease them. The veteran of Tillamook, for example, has benefited from the good services of Mr. S. H. Strain, of the Lighthouse Literature Mission, Belfast, for he writes to him on behalf of his crew: 'Here we are imprisoned on a rock, by water all surrounded, with communication by tender bringing the mail about every 40 or 50 days, and we appreciate your kindness in sending us your parcel of books. It makes a fellow feel good to know that someone is thinking about the prisoners out on the Rock, who long for some outside news. It's a lonesome place, and some men do not stay for any length of time.' We can quite understand that they do not! Still, the present keeper, who is 67 years of age, has stuck it for close on a quarter of a century. But as he says, 'it won't be very long until I will coil the ropes and go ashore.' We hope when he does he will long enjoy the rest he has so thoroughly well earned."

Is anyone in San Francisco sending books to the lighthouse keepers of Singapore and Ceylon?

Who's Who afloat and ashore

Edited by Jerry Scanlon

THE steamship dinner staged recently at San Francisco under the auspices of the Pacific Traffic Association in the Elks' Club will linger long in the memory of all those fortunate enough to attend the function.

William Dooling of the American-Hawaiian Steamship Company was chairman of the festivities and under his skippership the events of the evening were handled in shipshape manner. The beautiful dining room was transformed into a maritime setting with flags of all steamship lines adorning the walls.

An instructive talk was delivered by Hugh Gallagher, operating manager of the Matson-Oceanic Line, who dwelt on ships and shipping, vividly explaining his remarks with the assistance of a model ship, showing how cargo is stowed aboard a vessel.

Sea chanties and nautical numbers were rendered under the direction of Captain Leighton Robinson.

Those in charge of the arrangements included William Dooling, American-Hawaiian Steamship Company, chairman; Corbett Moody, Bay Cities Transportation Company; Herbert Lindley, California & Eastern Steamship Company; John McEwing, California Navigation Company; P. M. Holloway, Furness, Withy & Company; George Williams, W. R. Grace & Company; Del Smith, Dollar Steamship Line; Charles A. Reali, General Steamship Corporation; H. Van Meuhr, Holland-America Line; L. P. Hamilton, Los Angeles Steamship Company; Miles Cantelow, Luckenbach Steamship Company; M. B. Woodson, McCormick Steamship Co.; R. R. Strickland, Nelson Steamship Co.; E. D. Paramino, Nippon Yusen Kaisha; Chester Norton, Norton, Lilly Co.; W. T. Hunter, Pacific Steamship Co.; John Willis, Panama Mail Steamship Company; R. M. Clare, Sacramento Navigation Company; E. A. MacMahon, Sudden & Christenson; Harry Adam, Swayne & Hoyt; Robert Sherriden, Transmarine Line; Louis Shain, Williams Steamship Company; Warren Clark, Williams, Dimond & Company.

"I Will Not Abandon You"—that striking painting by the English artist, Norman Wilkinson, R.I., that is hanging in the San Francisco Marine Exchange—is the center of more interest among sea captains and maritime executives than any sea painting that has been shown on 'Change for several years. The scene depicts the United States liner President Roosevelt as she heads through the tumultous seas to the rescue of the British freighter Antione in distress in the North Atlantic. The painting was purchased and presented to the Merchants' Exchange by John Lawson of Balfour, Guthrie & Co.

Captain Roger Williams, operating manager of the International Mercantile Marine Co., was much impressed, on a recent visit to the Pacific Coast, with the progress of intercoastal and offshore shipping. He made the statement that the Panama-Pacific Line contemplates the construction of two more ships like the new liner California.

The steamer Arctic of the Alaska Packers' Fleet and the steamship Bering, the latter recently reconditioned for the same company at the plant of the General Engineering & Drydock Company, Alameda, will take two 45-foot diesel launches to Alaska for service. The launches are the Teal and Rail and they were built at the Oakland yards of William Cryer & Son.

The hand of time is fast pointing a vanishing finger at the gallant sailers of the Alaska Packers' fleet. This year only seven of the white wings of the fifteen windjammers are to be dispatched to the Far North that headed out through the Golden Gate in 1926.

The Arctic, formerly the transport Newport, and the Bering, formerly the Dutch freighter Salatiga, will be the factors that decide the Alaska Packers' officials to curtail the number of the sailing fleet to head North the latter part of April for the Northern fishing waters.

After attending a series of conferences with directors of the Westinghouse Electric & Manufacturing Company, W. E. Martin, Pacific Coast representative, is due home. Mr. Martin visited the general headquarters of the company in East Pittsburg, New York, and other eastern centers.

Of interest to the engineering world afloat and ashore were the advices reporting the appointment of Joseph G. Worker as general sales manager and election as a member of the board of directors of the American Engineering Company of Philadelphia. Mr. Worker is well known in Pacific Coast engineering circles.

"Standing by" awaiting completion of the reconditioning of the steamer Pittsburg Bridge, Captain Mike J. Bulger is now in New York. The vessel was purchased a number of months ago by the Matson interests from the shipping board. Prior to his eastern assignment Captain Bulger, son of Captain John K. Bulger, chief of the United States Steamboat Inspection Service, was

(Continued on Page 25.)

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(Continued from Page 23.)

skipper of the freighter Maliko, one of the reserve fleet of the company. Captain Bulger is one of the youngest skippers in the Matson Navigation Company's services.

Merrill C. Johnson, formerly chief engineer on the Panama Mail liners Venezuela and Colombia, has been appointed traveling port engineer for the company on the Pacific Coast. He was succeeded on the liner Colombia by William Sykes, formerly first assistant engineer.

North Pacific business in the maritime world, in line with the rest of the Pacific Coast, looks much better for this time of the year than the same period in 1926, was the report brought back by W. D. Benson, Pacific Coast manager for the Transmarine Lines, who returned to San Francisco after touring all the offices of the North.

Advices from New York report that John C. Rohlfs, manager of the marine department of the Standard Oil Company of California, was feted at numerous functions by steamship and oil executives, many of them former San Franciscans, during his stop-over in the East on his trip to Europe. Robert Haig, marine superintendent of the Standard Oil of New Jersey, whose friends are legion in San Francisco where he was formerly connected with the activities of the Standard Oil, was one of the outstanding Eastern executives who was host to Mr. Rohlfs.

Mr. Rohlfs will be absent for several weeks in Europe and is expected back at his desk in late May or early June.

United Kingdom and Continental European shipping conditions will be surveyed by Harold H. Ebey, Pacific Coast representative of the Hamburg-American and Kosmos lines, who is now in London. Mr. Ebey will confer with heads of his company in Hamburg, and will also visit Captain Thomas Blau, United States Shipping Board representative at Bremen. Captain Blau was formerly skipper on transpacific liners of the Pacific Mail Steamship Company. Mr. Ebey was head of the Shipping Board offices at San Francisco during the war.

Steamship interests are awaiting official word of the proposal that was to be made on March 28 to the executive board of the Hamburg-American Line in Hamburg for the appropriation of 30,000,000 marks for the construction of new tonnage. Reports had it that the building program was to include fourteen new passenger and freight vessels, five of which would go into the Pacific-European service.

Some idea of the part that California plays as a world leader in the exportation of oil may be gleaned from the figures revealed by the Standard Oil Company (Calif.), showing a total of 43,945,214 barrels of oil being exported to all parts of the world during 1926. The Standard Oil (Calif.) has a total of 22 deepsea oil carriers and 18 river and harbor craft.

Howard E. Wollaston, chief officer of the steamship President Lincoln. Wollaston was recently presented with master's papers at the age of twenty-four, after six years' sea service.

Requiem was sounded for the gallant old St. Nicholas, when the vessel, which has been serving as cannery tender since June 1922, was towed up the Columbia River from Portland and burned for junk. The St. Nicholas, built at Bath, Maine, in 1869, was a full rigged ship and made many smart passages across the Pacific in the tea trade in the 19th century.

Frank C. McPherson, who recently organized the Alaska-Puget Sound Tug and Barge Company, is said to be looking round for two 300-horsepower Diesel tugs. He bought the steam schooner Winchester, the tug Samson, and the barge Washouglas as a starter for his business. The Winchester has been moored at the Oakland yards of the Hanlon Shipbuilding & Drydock Company.

The new company will operate between Seattle and Ketchikan. Mr. McPherson is a well known Puget Sound steamship man.

Axel Johnson, head of the Johnson Line whose fine fleet of motorships are regular Pacific Coast visitors in the European-Pacific trade, is now on the Pacific Coast on a survey of shipping activities and to confer with representatives of the line. When Mr. Johnson arrived in New York he was greeted by Fred L. Doelker, assistant manager of W. R. Grace & Company, general agents for the company, who accompanied the Swedish shipping magnate on his trip to the Pacific Coast.

This is Mr. Johnson's first visit to the Pacific Coast in five years. The growth of the entire Pacific Coast, the wonderful new terminals, and other water-way improvements were a revelation to Mr. Johnson, he stated.

The condition of affairs in the Pacific Coast offices of the American Bureau of Shipping were highly satisfactory to Captain C. A. McAllister, president of the organization, on a recent inspection. Captain McAllister made the trip from New York aboard the Dollar liner President Adams, leaving the vessel at Los Angeles harbor and proceeding to San Francisco, Portland, and Seattle by rail.

Portland friends of Walter Haynes report that he is now established as one of the active marine surveyors of the Oregon port. He was six years with Norton, Lilly and Company in the North until resigning to enter the surveying business.

Hugh Montgomery, who was engaged in admiralty law in Portland for many years is now established in the San Francisco offices of the Dollar Line, as general counsel for the shipping company.

The beckoning finger of the Master Mariner was answered by two well-known Pacific Coast steamship men last month.

Captain Thomas W. Smith, whose rich Scotch burr was a familiar note on the floor of the San Francisco Merchants Exchange was stilled by death on March 11 at his Berkeley home after a short illness. Captain Smith was engaged in the marine surveying business for eleven years prior to his passing. His eldest son is Thomas Smith Jr., first assistant engineer of the Shipping Board freighter West Prospect of the Swayne & Hoyt fleet. He was 57 years of age.

Captain W. H. Logan, who served as special officer of the London Salvage Association on the Pacific Coast for a quarter of a century, passed away after a brief sickness in Victoria, British Columbia.

Passenger business from Eastern points via the Panama Canal to the Pacific Coast will be much larger during 1927 than any previous year, was the optimistic report brought back to San Francisco by William A. Young Jr., general passenger traffic manager of the Panama Mail Steamship Company, after a two months' absence that covered a sea and rail tour of more than 15,000 miles.

Mr. Young conferred with all the leading passenger and travel executives on the East Coast. He stated the bookings for early spring and summer were much heavier in Eastern passenger offices for the Pacific Coast business than the same time last year.

A survey of European offices is being made by James King Steele of the San Francisco offices of the Nippon Yusen Kaisha. Mr. Steele sailed last month for the Far East, and while there was instructed to proceed to Europe to become acquainted with the activities of the company in that part of the world. He is expected home the latter part of May.

Left to right: David Porter, second officer, William C. Fogarty, third officer, and Peter Hansen, chief officer on the motorship City of San Francisco. All of these men hold masters' licenses.

In possession of Captain Frank H. Claret, master of the Atlantic Transport liner Minnewaska, is an original bill of lading of the vintage of 1757, and it is believed that the document is the oldest specimen of its kind in existence. The 170 year old document was presented to Captain Claret by W. C. Coles, a New York broker.

A California resident has the distinction of booking as the first passenger aboard the new Panama Pacific liner California, now nearing completion at the yards of the Newport News Shipbuilding and Drydock Co., and which will go into the coast to coast service late this year. The reservation was addressed to Leo. E. Archer, Pacific Coast manager of the Panama Pacific Line, by O. L. Starr, general factory manager of the Caterpillar Tractor Company of San Leandro, California.

Steam up on Malolo. The new crack liner of the Matson fleet, now nearing completion at the shipbuilding yard in Philadelphia of the Wm. Cramp & Sons Ship & Engine Building Company.

Her name changed from the Zealandia to Minnesota and shifted from the New York-Antwerp run to the London-New-York run, the Minnesota will inaugurate her new service for the Red Star Line on April 30, sailing from New York. The vessel will operate fortnightly opposite the steamship Minnekahda as a third class tourist carrier.

A review of the Atlantic passenger and freight business reported from European centers and New York by executives of the International Mercantile Marine Company, was followed by a report from P. A. S. Franklin, president, that the outlook in this trade for 1927 is bright.

Fred B. McClure, passenger manager in Canada for the Cunard Line, completed his inspection tour of the Pacific Coast late in March and reported that he was well pleased with the outlook for this year. During his stay here he was entertained by Arthur B. Sweazey, Pacific Coast manager, and other steamship notables.

The crack coastwise steamer H. F. Alexander of the Admiral fleet will be back in service on May 17, President H. F. Alexander has announced. Captain George H. Zeh will take the vessel out of Seattle for San Francisco and Los Angeles on her first trip. All the other officers will be aboard. The vessel has been undergoing her annual overhauling at Seattle during the winter months. A reception to steamship and travel heads is planned upon the arrival of the vessel at San Francisco and Los Angeles.

While the exact date has not been announced the crack liner Malolo of the Matson fleet, now building at the Cramp yards in Philadelphia, will be commissioned for service in May, was the important announcement made by William H. Sellander, passenger manager of the company. As our illustration shows, machinery installation is complete, and boilers and turbines have passed dock trials. The finishing of passenger accommodations is nearing completion.

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Pacific Marine Review

The National Magazine of Shipping

May, 1927

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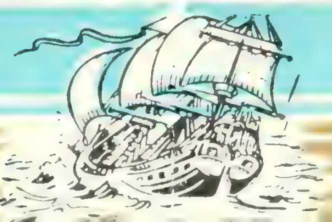

Official Organ
Pacific American
Steamship Association

Official Organ
Shipowners' Association
of the Pacific Coast

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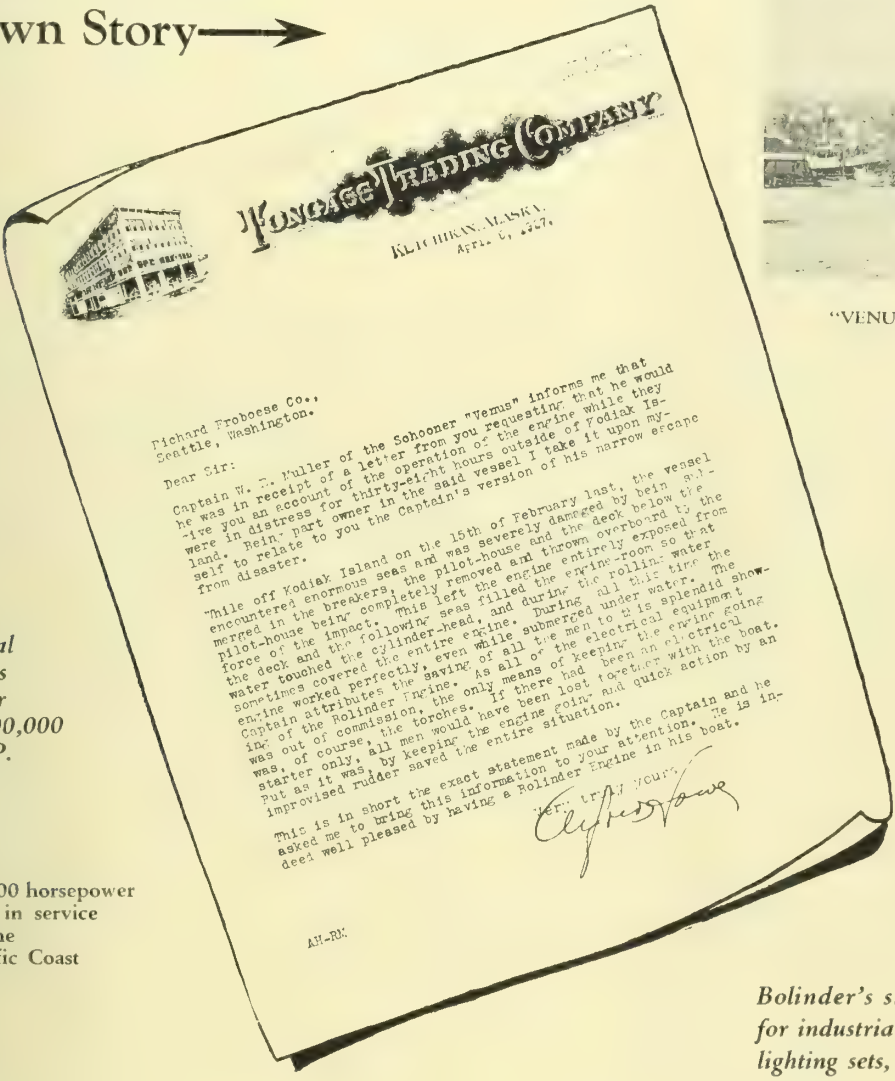

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Dear Sir:

Captain W. E. Muller of the Schooner "Venus" informs me that he was in receipt of a letter from you requesting that he would give you an account of the operation of the engine while they were in distress for thirty-eight hours outside of Kodiak Island. Being part owner in the said vessel I take it upon myself to relate to you the Captain's version of his narrow escape from disaster.

While off Kodiak Island on the 15th of February last, the vessel encountered enormous seas and was severely damaged by being submerged in the breakers, the pilot-house and the deck below the pilot-house being completely removed and thrown overboard by the force of the impact. This left the engine entirely exposed from the deck and the following seas filled the engine-room so that water touched the cylinder-head, and during the rolling water sometimes covered the entire engine. During all this time the engine worked perfectly, even while submerged under water. The Captain attributes the saving of all the men to this splendid showing of the Bolinder Engine. As all of the electrical equipment was out of commission, the only means of keeping the engine going was, of course, the torches. If there had been an electrical starter only, all men would have been lost together with the boat. But as it was, by keeping the engine going and quick action by an improvised rudder saved the entire situation.

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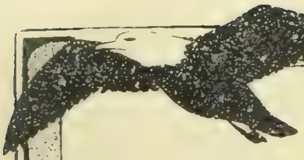
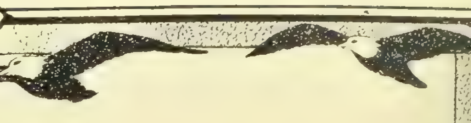


Pacific Marine Review



CONTENTS

May, 1927

Frontispiece ... 203

Editorials ... 205
Government Operation; Pilot House Control; American Shipbuilding; Foreign Trade Convention; New Economies in Steam.

Port Planning, by Norman F. Titus ... 208
A brief consideration of the essential factors necessary to the intelligent planning of modern terminals for handling overseas commerce.

The Sewall "Big Four," III., by F. C. Matthews ... 210
The famous four-masted sailing ship Susquehanna.

World Building Tankers ... 211
A great program of construction in bulk oil carriers.

The Carquinez Bridge ... 214

Power Plant of a Modern Ferry ... 216

The Diesel Ferry Golden City ... 217

Pioneer Modern Shipbuilding in Japan, by Robert Clark ... 218

Whaling Up-To-Date ... 220
Some notes on a Pacific Coast floating whaling station.

New Fireboat for the City of Seattle ... 222
Pacific Coast Engineering Company building steel hull to house Winton, Byron-Jackson fire fighting equipment for Puget Sound.

New Fireboats for the City of Portland, Oregon ... 224

Auxiliary Schooner Yacht Northern Light ... 226

Pacific Workboats and Their Power Plants:

- Southern California Workboat Notes ... 229
- The Hall Scott 175 ... 231
- Veneer Panels ... 231

Auxiliaries, Ship Supplies, Marine Equipment:

- New Westinghouse Geared Turbines ... 232
- Contra-Propeller Economy ... 232
- Thermit Weld on West Keene ... 232
- Air Driven Portable Hand-Saw ... 235
- New Step-Back Relay ... 235
- Rich System on Steamship New York ... 235
- Stelliting Dredge Cutters ... 236
- Welding Machine of Welded Steel ... 236
- Eliminating Leak Losses ... 237

Marine Insurance ... 239

American Shipbuilding ... 245

Trade and Traffic Trends:

- Accident Prevention on Tank Steamships, by Arthur M. Tode ... 11 Adv. Sec.
- Selling the World ... 13 Adv. Sec.
- Life on Pacific Coast Tankers, by Wm. P. Lindley ... 14 Adv. Sec.
- Puget Sound Trade ... 17 Adv. Sec.
- From Gold to Oil ... 17 Adv. Sec

Of a General Nature:

- Rapid Discharge of Silk ... 221
- A Master Mariner Model Builder ... 230
- Honored for Long Service ... 230
- New Astor Yacht ... 234
- R. W. Clark with Westinghouse ... 234
- Short Logs for Export ... 238
- New Steamers for Admiral Line ... 238
- America's Best Customers ... 238
- Is Europe Slipping? ... 238
- Trade Literature ... 232, 244
- Freights, Charters, Sales ... 21 Adv. Sec
- Chesapeake & Potomac Ports ... 21 Adv. Sec
- Who's Who Afloat and Ashore ... 23 Adv. Sec

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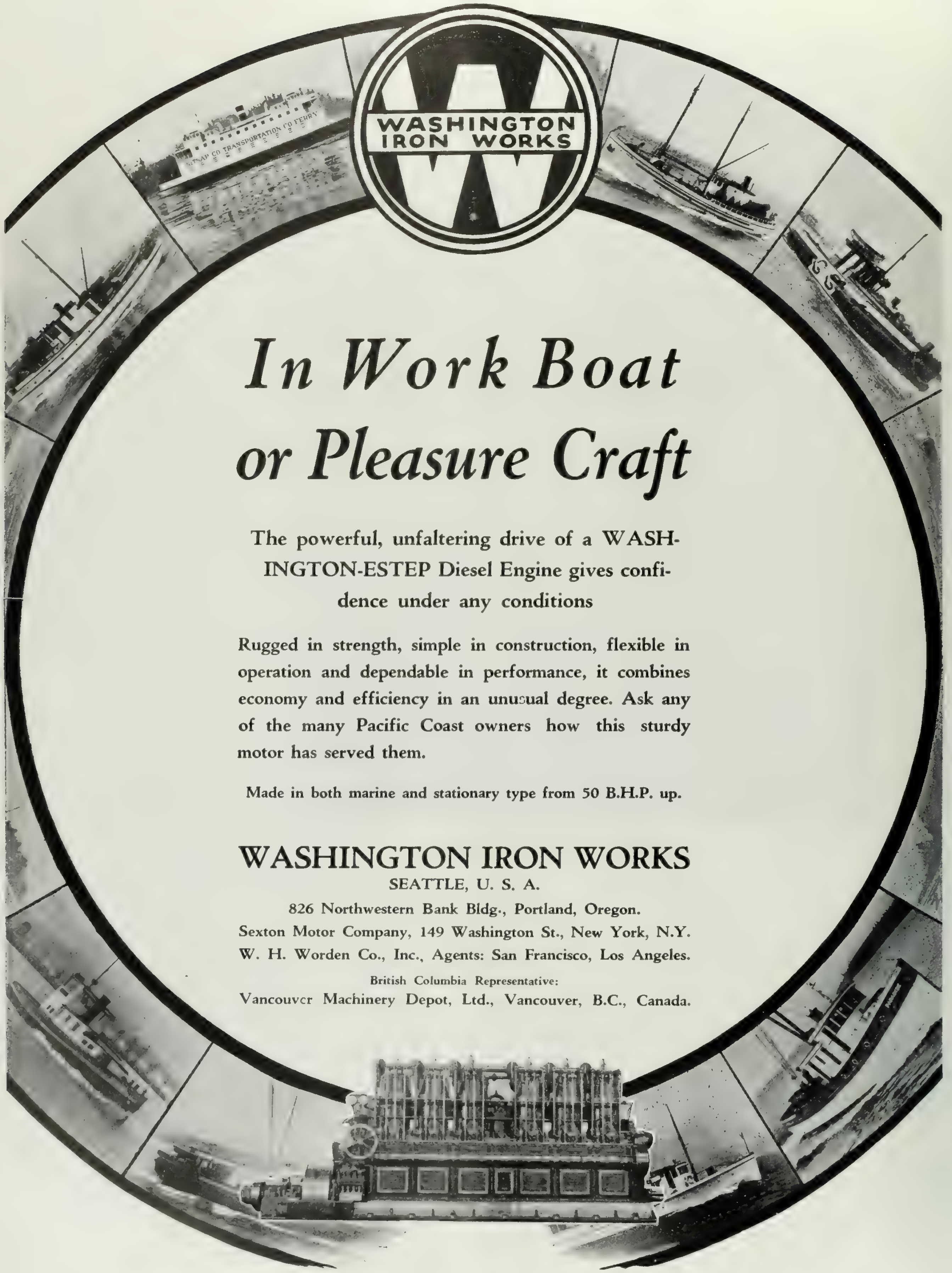

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MAY, 1927 Vol. XXIV., No. 5

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The National Magazine of Shipping

Official Organ Pacific American Steamship Association

576 Sacramento Street, San Francisco

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Official Organ Shipowners' Association of the Pacific

James S. Hines, President and Publisher.

Bernard N. De Rochie, Vice-Pres. and Manager.

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Alexander J. Dickie Editor.

Paul Faulkner, Advertising Manager

Fourteenth National Foreign Trade Convention

FOREIGN traders from forty states will listen at Detroit to an address by Secretary Hoover on May 26 next at the Fourteenth National Foreign Trade Convention. The convention will meet on May 25, 26, and 27, and 2500 foreign traders are expected to attend.

The address of the Secretary of Commerce will be delivered at a special luncheon session, under the auspices of the American Manufacturers' Export Association. His subject will be "American Foreign Trade," and a nation-wide radio audience will listen in to what is anticipated to be one of the notable business addresses of the year.

Among other outstanding features of the convention will be the addresses by Roy D. Chapin, chairman of the board of the Hudson Motor Car Co., on "The Motor Influence in Our Foreign Trade"; Governor Fred W. Green of Michigan, who is also managing director of the Ypsilanti Reed Furniture Co., on "Michigan's Vital Interest in Foreign Trade"; and Silas H. Strawn, chairman of the board, Montgomery, Ward and Co., "Foreign Uses for American Capital."

F. Edsel White, chairman of the board of Armour and Co., will preside at the luncheon session of the American Manufacturers' Export Association, and C. K. Woodbridge, president of the International Advertising Association, will be in charge of the export advertising session.

More than forty speakers, prominent in all phases of the country's foreign trade activity, will address the convention's thirteen group and general sessions. Some of those who appear on the program include Julius H. Barnes, president of the Barnes-Ames Co. of New York; W. F. Gephart, vice-president of the First National Bank, St. Louis; Turner Jones, vice-president of the Coca Cola Company, Atlanta; Professor L. D. O'Neil of Boston University; John A. Russell, editor of the Michigan Manufacturer and Financial Record; W. C. Sproull, advertising manager of the Burroughs Adding Machine Co.; ex-Governor James P. Goodrich of Indiana; J. A. H. Kerr, vice-president of the Security Trust and Savings Bank of Los Angeles; Robert V. Beucus, advertising manager of Bauer and Black, Chicago; and C. C. Martin of the National Paper and Type Co. of New York.

Special traffic accommodations will be made for delegates attending the convention from a number of midwestern cities, and a special train has been scheduled by the New York Central Railroad for Eastern delegates. Reduced railway fares from all parts of the United States and Canada have been granted by the Trunk Line Association.

Following the precedent of last year, the platform of the convention will be turned over at the first afternoon session to foreign trade spokesmen from Canada and representative leaders from the different sections of the Dominion, who will put before the delegates the kindred problems of Canada and the means for promoting friendly business cooperation across the border. A delegation of 500 Canadians is expected to attend the convention under the auspices of the Canadian Board of Trade. The convention will also serve as a meeting ground for many other delegates from the British Dominions and will be addressed at the general session of Thursday morning, May 26, by speakers from Australia, South Africa, Irish Free State, and other parts of the British Commonwealth.

Another visiting delegation of great interest to American foreign traders is the group of Latin American business men, who will attend the convention following the Third Pan-American Commercial Conference which meets in Washington earlier in the month under the auspices of the Pan-American Union. A general invitation has been extended to all delegates at this conference to remain over for the Detroit Convention, where they will be represented on the program and where special acquaintance plans will be promoted on their behalf among American foreign traders interested in Latin American trade.

Advance registrations indicate the largest convention yet held by the National Foreign Trade Council.

Government Operation

THE United States Shipping Board, having dropped the word "Emergency" from the title of its operating corporation and served notice to the shipping world that it is in the business of operating American ships in foreign trade until such time as it can show a profit and sell these ships to private operators, it would seem to be high time for American shipowners and all American citizens to reflect seriously upon what is involved in government operation of overseas shipping.

It will be remembered that the reason for the existence of the Shipping Board, aside from the accidental incidence of the entry of the United States into the European war, was limited to discovering the reasons why American ships could not be operated at a profit in foreign trade and telling Congress how those reasons could be eliminated. After ten years of more or less hectic existence, although the Shipping Board has been quite vocal, the reasons for that impossibility are still with us.

The Shipping Board now being permanently engaged in operating its own ships, it should become the business of every patriotic American citizen to see that such operation is continued under exactly the same conditions as would apply if the operation was under private control.

The best way to get rid of objectionable, unjust, and discriminatory legislation is to apply it indiscriminately.

Any government regulation which holds up a privately-owned ship should also hold up a government-owned ship where that ship is engaged in commercial pursuits.

If a sailor on a Merchant Fleet Corporation vessel is caught smuggling opium, the fine for such offense should be immediately libeled against the vessel and the vessel held until the fine is paid.

All of the various rules and regulations which vex the private operator under American conditions should be even more stringently observed on ships operated by the government in competition with privately-owned ships.

In no other way can the United States Shipping Board and the federal government be more vividly impressed with the handicaps against American ships, and if, after ten years or so of hard experience, the federal government can learn enough about world conditions in shipping to pass some common-sense legislation thereon, the money expended in the experiment and the grief experienced by private shipowners will be well compensated.

There is, however, another aspect of government operation, particularly in foreign trade, that should condemn it to the good sense and patriotism of the American citizen. There is probably no surer way to bring about acrimonious international disputes filled with the seeds of discord, and of possible war, than for a great government like that of the United States to enter into direct commercial competition with the citizens of other nations. Let us do some serious thinking. We must necessarily spend a lot of our money to keep these ships in business. Far better to spend it indirectly than directly.

New Economies in Steam Propulsion

FOR some years prior to the late war new transatlantic liners were adopting triple screw propulsion with reciprocating engines on the outboard shafts and low pressure turbine or geared turbines on the central shaft. The advantage of this system is, of course, the expansion of steam in useful effort down to a very low vacuum.

About ten years ago, Dr. Bauer, managing director of the Vulcan Works at Hamburg, patented an arrangement applying this system to single screw vessels. Dr. Bauer's arrangement has now been applied by Dr. Wach of Bremerhaven in several installations. The Bauer-Wach system consists essentially of a reciprocating, triple expansion engine which exhausts into a low pressure steam turbine whose shaft is geared to the shaft of the engine through double reduction helical gearing and a hydraulic clutch coupling. This coupling is gradually filled up after the reciprocating engine is under way, thus enabling the turbine to pick up its load gradually and without shock to the gears. It was found in an experimental unit on shop tests that it was possible to get a power increase of 30 per cent by the addition of the turbine without any increase in total steam consumption.

Two large steamers, the Elberfeld, of 9350 tons deadweight, and the Ockenfels, of 11,355 tons deadweight, have been converted to this system and are performing very satisfactorily. Exhaustive trials have been held on the former vessel, which is owned by the Norddeutscher Lloyd. She uses superheated steam from coal-fired boilers at 215 pounds per square inch pressure. The original triple expansion engines develop 3200 indicated horsepower. With the exhaust turbine added, 4000 indicated horsepower was developed on the some fuel consumption.

Several sets of new machinery of this type have been ordered by large German shipping firms for new steamers now building. These range up to sets of 6500 indicated horsepower for cargo steamers. The exhaust turbine and gear connection is very compact. In one or two instances of conversion the introduction of the Michell type of thrust block in place of the old multi-collar horseshoe type saves almost enough space to accommodate the change in the existing engines.

It would seem that there is an excellent opportunity here for affecting economies in marine steam plants by a comparatively inexpensive alteration.

Back Seat Driving

THE Supervising Inspector of the United States Steamboat Inspection Service at San Francisco has issued an order stopping the use of so-called pilot house control in ferryboats on San Francisco Bay. This order reads:

> "On ferryboats of your company whose engines are under pilot house control and operated from the pilot house, you are hereby notified that this practice must cease immediately. The engines must be handled by the licensed engineer stationed in the engine room for that purpose, and the usual signals of transmission from pilot house to engine room must be used."

The phrasing of this order indicates ignorance of the control in question. There are no ferryboats on San Francisco Bay whose engines are under direct pilot house control. The engines of every ferryboat on the bay of San Francisco are handled by licensed engineers stationed in the engine room for that purpose.

On the ferryboats at which this order is directed, a central power plant in the engine room generates electrical energy. This energy is transmitted to electric motors located for and aft and driving independently the forward and after propellers. A small portion of this electrical energy is directly controlled by the navigator at the pilot house and this control enables him to change at will the speed of each motor.

This system of distant electrical control of motor speed is known as the Ward Leonard system. It is not a new system. It has been universally used on the street cars of the world for thirty years. The original patents have run out. Pacific Marine Review has been advocating its use on shipboard for over ten years. It has been used on ferryboats on San Francisco Bay and other bays and rivers for over five years. No instance of damage to boat or passenger is on record with cause attributable to direct pilot house control.

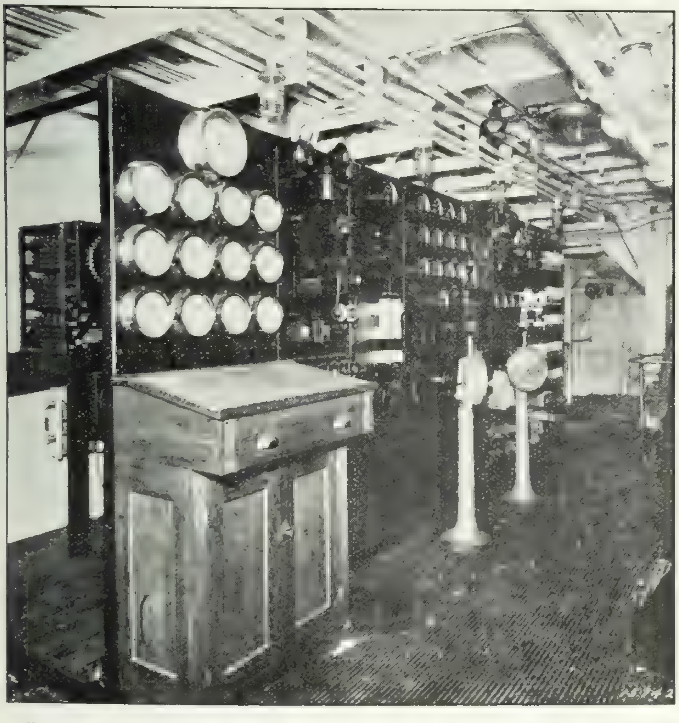
There must be pilot house control either direct or indirect. Direct control cuts out one uncertain personal element and is therefore safer.

We are told by the Supervising Inspector that "the captain has all he efficiently can do to steer his vessel, sound his whistle, and attend to the other duties of navigation without attempting to control the engines from the pilot house. He should transmit his signals to the engine in the regular way and allow them to be carried out by the licensed engineer there for that purpose. I am absolutely firm in that belief."

One is tempted to ask the Inspector to try his system out on an automobile. The analogy is almost perfect. Paraphrasing the quotation above, we must come to the conclusion that every bus should carry a licensed engineer because, "The driver has all he efficiently can do to steer his car, honk his horn, and attend to the other duties of navigation through our crowded streets. He should transmit his signals to the rear seat by mechanical or electrical telegraph and allow them to be carried out by the licensed engineer stationed there for that purpose."

We very much like the sound of that word "allow." We have heard in the past of a considerable number of cases in which the officer on the bridge apparently allowed proper signals to proceed from the bridge and the engineer on watch did not allow that they ever reached the engine room.

During the past thirty years, not a passenger out of more than a billion carried across San Francisco Bay has been drowned or killed through any casualty due to defective ship or equipment. This is a marvellous record, of which all the companies involved and the United States Steamboat Inspection Service may well be proud. The operating companies and the Steamboat Inspection Service are doing everything within their power to keep this 100 per cent safety record unstained. The engineering organizations of these companies, in designing new ferryboats, have adopted direct pilot house control at considerable increase in first cost, because of its splendid safety features and the saving of time in maneuvering. Undoubtedly this stop order will be withdrawn as soon as the Steamboat Inspection Service has formulated regulations covering the installation and use of this well tried, dependable, direct system of ferry navigation.



Control stand and switchboard in the engine room of the turbo-electric ferryboat Peralta recently put into operation on San Francisco Bay.

The engine room receives telegraphs from the pilot house just the same as any steamer, but the motion of the ship herself is controlled directly as in a street car or automobile.

Great Lakes Tonnage

THE volume of bulk freight handled by vessels operated on the Great Lakes set a new record in 1926, according to an official report forwarded to Chairman T. V. O'Connor of the United States Shipping Board by the Lake Carriers' Association. The total movement during the year amounted to 121,289,502 net tons, a figure 8,000,000 tons greater than the movement in 1925, and 260,000 tons greater than in 1923, when the previous record was reached.

The report shows a total of 437 steel cargo ships and 32 steel passenger ships operating on the Lakes under the American flag, while 183 steel cargo vessels and 21 steel passenger vessels were listed as Canadian-flag ships. In addition, there are large numbers of tugs, wooden steamers, wooden barges and steel car ferries under each flag.

The total number of vessels operating as cargo carriers on the Lakes was increased from 752 to 755 during the year, and the capacity of the total climbed from 4,322,317 gross tons on January 1, 1926, to 4.372,767 gross tons on January 1, 1927. The change in this total resulted from a loss of 36,800 gross tons and the addition of 87,250 gross tons in new ships.

The movement of bulk freight, which is by far the most important traffic on the Lakes, shows substantial advances in all departments excepting grain. The movement of iron ore amounted to 58,538,000 tons, a gain of about four and one-half million gross tons over 1925; coal shipments totaled 31,011,000 gross tons, a gain of 3,000,000 gross tons over 1925; stone shipments advanced 1,300,000 tons to a total of 12,628,000, while shipments of the various kinds of grain fell off about 1,300,000 gross tons to 12,087,000 for last year.

Lumber for South America

AN extraordinary increase in Pacific Coast lumber shipments to Argentina is revealed in figures recently made public by the General Steamship Corporation. The movement during 1926 totalled 50,764,000 feet, representing an increase of 71 per cent over 1925 shipments, which totalled 29,618,000 feet.

This large increase is especially significant in view of the somewhat depressed conditions that have existed in Argentina during the past year. Present reports indicate that there is ground for reasonable optimism concerning the outlook for 1927, and further growth in Pacific Coast business with the River Plate region is predicted—not only in lumber, but in canned goods and manufactured items. The improved shipping facilities that have existed since the inauguration of the Westfal-Larsen Line in the early part of 1926 have been largely responsible for stimulating this business.

This increased movement of lumber bears out the prediction of H. S. Scott, president of The General Steamship Corporation, on the occasion of his visit to South America in 1925, when he expressed the opinion that increased purchases of Douglas fir by Argentina and Uruguay would be the inevitable outcome of the rapid depletion of Southern pine available from the Gulf.

Port Planning

A Brief Consideration of the Essential Factors Necessary to the Intelligent Planning of Modern Terminals for Handling Overseas Commerce

By Norman F. Titus, Chief, Transportation Division, Bureau of Foreign and Domestic Commerce

EVERY newspaper is a testimony of the public's keen interest in port development. Nor is the public interest a thing of the moment only. A recent reprint in the daily press under the column designated "News of Twenty-Five Years Ago" reveals that at that time Governor Pardee had made a tour of inspection of the San Francisco waterfront and was expressing himself as to the necessity for extensive harbor improvements. His remarks had a mighty familiar ring to them and could have been made today by the present governor. Moreover, the interest in port planning is not to be found solely on the Pacific Coast, but Manchester, Hamburg, Marseilles, Antwerp, and many other groups of cities also have their problems and their extensive plans for the future. Literally, all the great marts of the world are tremendously busy with port development. Only a few days ago a very interesting article discussed the millions spent on harbor improvement and mechanical equipment at Montevideo, Uruguay. Yet, one does not have to go so far afield for an outstanding example of strenuous effort to attract trade by an ambitious program of harbor development. The little Port of Astoria, Oregon, has recently expended $4,500,000 in the construction of wharves and the purchase of equipment.

Terminal Benefit

The fundamental reason for this interest is the desire to obtain the benefits that the business of shipping creates in a port. The average steamer expends $3000 to $35,000 in port. She pays heavily for fuel, for longshore wages, for provisions, stores and dunnage, for pilotage and towage, and also provides employment for the shore force of the steamship company. Aside from all the direct benefits mentioned above, it should not be overlooked that the ship is also a great port asset from the standpoint of repairs, drydocking, painting, and equipment. Further than this, there is the revenue to be derived from warehousing, banking, insurance, revenue by hotels, shops, and theaters from crews and passengers, and so on indefinitely. An idea of how greatly these benefits are prized can be obtained from the statements of the officials of the Port of Astoria. These men inform us that ultimately, when their terminals will be used to their greatest capacity, the port district will face an annual deficit of $100,000. They state that this deficit will be met cheerfully because of the benefits, direct and indirect, derived from the port's activities.

Terminal Expense

On the other hand, from the steamship standpoint the terminal is one of the most important factors in the business of shipping. It is vital both to the shipper and the shipowner. From the shipper's standpoint it represents a large proportion of the transportation cost, in fact, altogether too large a proportion. A splendid illustration of how disproportionate this expense might become is afforded in the case of a shipment from Philadelphia to New York, in which the terminal expenses represent thirteen-fourteenths of the total expense. The shipowner is tremendously interested in terminal operations for they determine his measure of profit. He is affected in two ways—first, the facilities of the port directly affect the turn-around of his vessel; and, secondly, the total terminal expense is a large factor in his revenue. For instance, in the intercoastal trade the New York terminal expenses represent, on the average, fifteen to twenty per cent of the total voyage expense.

It is quite evident, therefore, that the port is a matter of vital concern to the tax-payer, the shipper, and the shipowner. The importance of the port combined with the obvious fact that cities throughout the world are spending untold millions in this development naturally suggests the question whether the mere constructing of piers constitutes a successful port, or whether port building is a highly organized business and one that requires a well coordinated plan. The answer is quickly found, for an examination of the ports of the world proves conclusively that lack of adequate planning spells disaster and that the really successful ports have recognized the wisdom of building in accordance with a scientific plan.

Factors Involved

In actual practice it is found that the activities of the central port authority embrace construction, maintenance, operation, traffic, and accounting. It is recognized that there are many factors involved in making a successful port; the most important of these are:

1. Docks, wharves, and warehouses.
2. Freight handling facilities.
3. Lighterage equipment and other harbor craft.
4. Drydock and repair facilities for ships.
5. Railroad connections, belt line railroads, rates.

Wharves and Warehouses

In developing these factors the ideal port authority wisely studies results throughout the world. For the Pacific Coast ports much illuminating information is gained by this world-wide survey. For example, in the first factor the engineering department finds much of value in studying types of docks and wharves in eastern and foreign ports. The question of warehouses, however, is a vital one. Here it is where so many otherwise perfect ports utterly fail. The most enlightened practice holds that wharves and piers should have transit sheds to shelter goods actually in transit, but here they should rest only a minimum of time. Even the least of storage should be provided by a warehouse. Piers should never be used for storage purposes. Consequently, the construction and relationship of piers and warehouses is one of the most exacting problems of port development. Unquestionably, the best known and most successful example of modern approved practice along this line is the Bush Terminal location in Brooklyn. Space does not permit a description of this remarkable enterprise, but, suffice it to say, this terminal achieves phenomenal results by bringing into the closest possible physical contact ocean carriers, warehouses, and factories. The secret of its success lies in the fact that all of the elements are close together, and thus mechanical devices, like conveyors, greatly reduce handling costs and bring terminal costs to a minimum.

Freight Handling Facilities

When the second factor of freight handling facilities is considered, here again it is noticed that we can profit much by the experience of others. The cargo mast is an up-to-date handling device and can well be put into practice. But even the efficiency of the cargo mast is excelled by the results obtained from the use of cranes in such highly efficient ports as Hamburg or Antwerp. The significant fact about crane operation is that experience in Europe and South America demonstrates that it can handle cargo at the rate of 220 to 250 tons per hour and the crane manufacturers guarantee a cost of about one-half that of the cargo mast or ship's gear. It is strange that America with its claims to industrial supremacy should be so backward in mechanical devices as applied to shipping.

Floating Equipment

Concerning the third factor of lighterage equipment and other harbor craft, we find much diversity of practice throughout the world. In general terms, however, it might be stated that no port can be truly great without complete equipment along this line. American experience has demonstrated that for local delivery instead of cartage between warehouses or industrial plants situated on navigable waters within fifty miles of the ship, the lighter is unquestionably the most economical and convenient medium. Here again, European practice affords us much food for thought for there it is quite common to take cargo from the ship's side and deliver direct to warehouses which are purposely situated on water frontage. This direct lighterage at a cost of 65 to 75 cents a ton compares very favorably with our customary chain of three operations including wharfage, handling, and cartage before delivery to the warehouse.

The importance of the fourth factor of drydock and repair facilities is obvious and needs no comment.

The remaining element of railroad connections, belt line railroads, and traffic solicitation is the factor that permits of great expansion and gives, probably, the greatest scope for port salesmanship.

Load Factors

One of the items of greatest influence in port competition is the co-called load factor. By this is meant that the ship bringing a cargo to a port will get another cargo out. The port with the greatest influence is the port that offers full cargoes both ways. The best example of the operation of this principle is the case of Montreal, where small cargoes inward are offered against full outward cargoes. Hence, Montreal suffers in comparison with the American ports which take full inward cargoes. Montreal is a great port in spite of this handicap, but it is constantly struggling to overcome this disadvantage by various devices, the principal one of which is a reduced scale of railroad rates to interior points. All the handsome piers and deep channels which money and engineering skill can create will not bring ships to a port unless the hinterland can aid in supplying a cargo out as well as absorbing a cargo in.

In the development of the railroad situation, it has sometimes occurred that the railroads have obtained ownership of the waterfront, the pier, and even the line of ships berthing at the pier. It has been found that such a situation is inimical to the public and, quite generally, to the railroads themselves. The railroad is indispensable in its service of the port, but it should consist solely of a means of communication with the hinterland. The solution of the problem of rail coordination at a seaport is the belt-line railroad, publicly owned.

The belt-line railroad should serve two needs—first, it should enable a car to be interchanged from the lines of one company to those of another, and, secondly, it should connect the piers and wharves of the port in such a manner that a car loaded at any pier may travel to any other pier, or to any railroad line. The really successful ports are those in which the belt line is a fully developed and important factor. It is now recognized that the first principle in port building is—there must be physical connection between every pier and every railway and every warehouse with a uniform system of charges.

Port Salesmanship

One of the most modern phases of port development is in salesmanship, this being exhibited through the medium of traffic departments. This is a comparatively new venture. Nevertheless, many ports have highly developed traffic organizations. Port traffic managers are now paid $10,000 to $25,000 a year, and not only do they exert themselves to build up the finest system of railroad and steamship connections at the port and strive mightily to have put into effect the most favorable rate fabric, but they also reach out and energetically solicit traffic directly. The Port of Portland maintains traffic representatives in various parts of the world; the Port of Baltimore gives lectures, illustrated with moving pictures of its harbor, throughout the middle west. The sales or traffic departments of ports are certainly becoming increasingly important.

No longer can a community participate actively in world commerce by the mere construction of a pier and awaiting cargo. A port is a highly organized modern business and must be operated with a definite plan or disaster will result. The port must be planned right; it must be constructed right and operated efficiently, and, to be a success, modern methods of salesmanship must be employed to attract the greatest amount of business possible.

The Sewall "Big Four", III.

The Famous Four Masted Sailing Ship Susquehanna

By F. C. Matthews

THE Susquehanna was smaller than either of the three other members of the famous Sewall group, her register being but 2744 tons gross; 2628 tons net. She was the ninety-third vessel built in the yards of Arthur Sewall & Co., of Bath, Maine, and was launched September 17, 1891. Her dimensions were 273:6 by 45:1 by 28:1. The fore, main, and mizzen masts were 38 inches in diameter, 84, 85, and 87 feet long, respectively. The topmasts were each 20 inches by 54 feet. The spanker mast was 90 feet by 27 inches, and its topmast, 68 by 16. The three lower yards were 88 feet long, by 21 inches; lower topsail yards, 80 feet, by 19 inches; uppers, 73 by 16½; topgallants, 60 by 13½; royals, 50 by 11; skysail yards, 41 by 8½. The spanker boom was 51 feet by 11½ inches, and gaff, 30 feet long. The steel spike bowsprit was 65 feet long, being 45 feet outboard. Two of her anchors weighed 6800 and 5600 pounds, respectively. She had wire rigging. Her cost was approximately $140,000.

Some authorities prophesied that the Susquehanna would prove to be a faster sailer than her predecessors, and early in her career she did make a passage which started a reputation for fast sailing ability, This, however, was not repeated and the rest of her work is about average.

On her maiden voyage the Susquehanna left New York December 11, 1891, and ran out to San Francisco in 126 days. At the latter port she loaded 3950 tons of wheat for Liverpool and sailing June 1, 1892, discharged her pilot at noon. On September 1, being then some few hours under 92 days out, she made Cape Clear and, being favored with a strong southwest gale, she bowled along to Liverpool, anchoring in the Mersey at 9:30 a.m. on December 3, making her passage 93 days, 21½ hours from the Golden Gate. She had crossed the line in the Pacific 19½ days out and passed Cape Horn on the 47th day, good time but not unusually fast. From the Horn to the Atlantic equator crossing she had the excellent run of 19½ days and continued making good time until reaching latitude 31 North, when she was becalmed for two days. As her best day's run on the whole passage was reported as being only 280 miles, it is evident that she experienced generally favorable winds throughout, particularly in both southern oceans, and her time between the two equatorial crossings, 47 days, is remarkably fast. Her whole run ranks as the third fastest from San Francisco to Liverpool, the record being held by the clipper ship Panama, of New York, 86 days 17 hours, made in 1860-1861, followed by that of the British ship Andelana, 93 days in 1893. In 1873-1874 the ship North American, of Boston, went over the course in 94 days.

The Susquehanna on dry-dock at Avonmouth, Bristol, England.

(Photo by Jas. Randall, Bristol, England, used through courtesy of E. S. Clark, San Francisco.)

The second voyage of the Susquehanna was in 1893, 122 days from New York to San Francisco, thence 128 days to Liverpool. She was then chartered to load 95,000 cases of kerosene at New York for Japan at 18 cents per case, and had a tedious voyage. In 1895-1896 she was 140 days from New York to San Francisco, thence 128 days to Avonmouth. On March 20, 1900, she reached San Francisco in 114 days from New York, the only fast portion of the run being her 17 days from the Pacific equatorial crossing to destination. Completing this voyage she was 115 days from Hilo, Hawaii, to Delaware Breakwater, with a cargo of sugar.

On November 15, 1900, the Susquehanna sailed from Norfolk, Virginia, with coal for Manila and did not reach her destination until June 7, 1901, a passage of 204 days. She had been practically given up as lost a month before news of her arrival reached this country. In 1902 she was 125 days from Baltimore to San Francisco, thence 109 days to New York. Her next passage was also from Baltimore to San Francisco 125 days, and on the return was 136 days from Hilo to Philadelphia.

On August 10, 1905 the Susquehanna was at New Caledonia to load chrome ore in company with her associate in the Big Four fleet, the Roanoke. The latter caught fire and in spite of the exertions of her crew, assisted by the crews of the Susquehanna and a Norwegian bark, was entirely destroyed. The chief mate Griffin of the Susquehanna, who was particularly active in the fight against the fire, was almost overcome and was helpless for some hours afterwards. After loading her cargo for Delaware Breakwater, the Susquehanna left Nehhoue, New Caledonia, on August 23. When three days out, her heavy cargo proved to be more than her wooden hull would stand, and after straining considerably, her back was practically broken in three places. By the time the pumps were rigged there was five feet of water in her. The pump shaft soon broke and all hands took to three boats, leaving the ship with seven feet of water in the well and twelve feet in the fore peak. Before the boats were many lengths distant, the ship took a dive and went down bow first.

In the boat of Captain Watts were Mr. Elwell, formerly mate of the Roanoke, and his wife, and the pluck and hardihood of Mrs. Elwell in an open boat for seven days on the tropical sea gained her the praise of all hands. All the boats headed for the Solomon Group, the Captain's boat being picked up by a trading schooner,

(Continued on Page 213)

World Building Tankers

A Great Program of Construction in Bulk Oil Carriers

TYPE	D.W.T.	GROSS	OWNERS	BUILDERS	TYPE MACHINERY
M/S	12,580	8,900	Anglo American Oil Co., Ltd.	Workman Clark & Co.Ltd.Belfast	Sulzer Si.Sc. 3,500 bhp.
M/S	12,580	8,900	" " " " "	Sir J.Laing & Son Ltd. Sunderland	Doxford, Si.Sc.3,500 bhp.
(2)	25,160		Total		
M/S	10,000	6,975	Anglo Saxon Petroleum Co.Ltd.	Rotterdam D.D.Co.Ltd.,Rotterdam	Werkspoor,Si.Sc.4 stroke double actg.6 cyl.3500 bhp.
M/S	10,000	6,975	" " " " "	" " "	Werkspoor,Si.Sc.4 stroke double actg.6cyl.3500 bhp.
M/S	10,000	6,975	" " " " "	New Waterway S.B.Co.Ltd.,Schiedam	Werkspoor,Si.Sc.4 stroke double actg.6cyl.3500 bhp
M/S	10,000	6,975	" " " " "	Netherland S.B.Co.Amsterdam	Werkspoor,Si.Sc.4 stroke double actg.6cyl.3500 bhp.
M/S	10,000	6,975	" " " " "	Netherland S.B.Co.Amsterdam	Werkspoor,Si.Sc.4 stroke double actg.6cyl.3500 bhp.
M/S	10,000	6,975	" " " " "	N.V.Voor Scheepsen Werktingboub Fyenoord, Rotterdam	Werkspoor,Si.Sc.4 stroke double actg.6cyl.6000 ihp.
M/S	10,000	6,975	" " " " "	" " "	Werkspoor Si.Sc.4 stroke double actg.6cyl.6000 ihp.
M/S	10,000	7,725	" " " " "	Palmers S.B.&I.Co.Ltd.Jarrow	Double actg.Werkspoor 4 stroke 6cyl.6000 ihp
M/S	10,000	7,725	" " " " "	" " "	" " " " "
M/S	10,000	7,540	" " " " "	Hawthorne,Leslie & Co.Ltd.Hebburn	" " " " "
M/S	10,000	7,540	" " " " "	" " " "	" " " " "
M/S	2,300	3,600	" " " " "	Harland & Wolff Lt.,Govan	Burmeister & Wain,Tw.Sc.
M/S	2,300	2,300	" " " " "	" " Glasgow	" "
M/S	2,300	2,300	" " " " "	" " "	" "
M/S	2,000	1,050	" " " " "	" " "	" "
M/S	2,000	1,050	" " " " "	" " South,Yard	" "
M/S	2,000	1,050	" " " " "	" " Belfast	" "
M/S	2,300	3,600	" " " " "	Caledon S.B.&E.Co.Ltd., Dundee	Werkspoor Tw.Sc.6cyl. 3000 bhp.
M/S	2,300	3,600	" " " " "	Swan,Hunter & Wigham Richardson, Wallsend	" "
M/S	9,500	6,000	" " " " "	Atel-et Chant de la Seine Marit. Le Trait.	Werkspoor,Tw.Sc.4 stroke 6 cyl. 3,800 ihp.
M/S	9,500	6,000	" " " " "	" " " "	Werkspoor,Tw.Sc.4 stroke 6 cyl. 3,800 ihp.
M/S	12,000	-	" " " " "	Cantieri Navale,Monfalcone	-
M/S	12,000	-	" " " " "	" " "	-
(23)	170,500		Total		
S/S	8,000	5,000	Aral S.S.Co., Ltd.	Wm.Hamilton & Co.,Ltd,Port Glasgow	
S/S	11,575	8,300	Argentine Gov't.(Dept.Fiscal Oil Fields)	Chant et Atel,de la Gironde,Bordeaux	Triple expansion Si.Sc. 4,500 ihp.
-	7,500		Argentine owners	- Trieste	-
S/S	10,300	6,800	Association Petroliere	Chant Navals Francais,Blainville(Caen)	Triple expansionSi.Sc. 3,000 ihp.
S/S	10,300	6,800	"	" "	Triple expansion S.Sc. 3,000 ihp.
(2)	20,600		Total		
M/S	8,600	6,000	Atlantic Tank Riederei m.b.H.	Weser A.G.Bremen	M.A.N.Si.Sc.4 stroke Single actg.6cyl.2,000 bhp.
M/S	8,600	6,000	" " " "	" "	M.A.N.Si.Sc.4 stroke Single actg.6cyl.2,000 bhp.
M/S	8,600	6,000	" " " "	" "	M.A.N.Si.Sc.4 stroke Single actg.6cyl.2,000 bhp.
(3)	25,800		Total		
S/S	8,000	5,500	Baltic Trading Co.	Sir. W.G.Armstrong.Whitworth & Co.Ltd. Walker Yard.	Triple expansion
M/S	9,000	6,700	Mr. Harry Borthen	A/B Gotaverken,Gothenburg	-
M/S	10,000	6,700	British Tanker Co.Ltd.	Palmers S.B.&I.Co.Jarrow & Hebburn	Sulzer-6 cyl.
M/S	10,000	6,700	" " "	" " " "	" 6 cyl.
M/S	10,000	6,700	" " "	" " " "	Doxford 4 cyl.Si.Sc.
S/S	6,100	4,000	" " "	" " " "	Triple expansion
M/S	10,150	6,900	" " "	Swan,Hunter & Wigham Richardson Newcastle	Sulzer
M/S	10,000	6,700	" " "	" " "	Neptune 3200 ihp.
M/S	10,000	6,700	" " "	" " "	Doxford 4 cyl.
M/S	10,000	6,700	" " "	Caledon S.B. & E. Co., Dundee	Burmeister & Wain
M/S	10,000	6,700	" " "	" " " "	" "
M/S	10,100	6,900	" " "	Lithgows,Ltd.Port.Glasgow	" " 8 cyl.
M/S	10,150	6,900	" " "	" " " "	" " 8 cyl.
M/S	10,100	6,900	" " "	Greenock Dockyard Co. Greenock	" " 8 cyl.
-	9,100	-	" " "	John Brown	
M/S	10,100	6,900	" " "	Sir. Jas.Laing & Sons Ltd.Sunderland	Doxford 4 cyl.-2500 bhp. 11 knots
-	10,000	-	" " "	" " " "	-
M/S	6,400	4,200	" " "	Sir. W.G.Armstrong,Whitworth & Co. Ltd.Newcastle	-
M/S	6,400	4,200	" " "	" " " "	
(17)	158,600		Total		
S/S	8,000	5,500	Burmah Oil Co.	Sir J.Laing & Sons Ltd.Sunderland	Triple expansion
S/S	8,000	5,500	" " "	" " "	Triple expansion
(2)	16,000		Total		

UNDER date of March 1, our Paris correspondent sends in the tabular statement reproduced herewith, showing the tankers now under construction in the shipyards of the world. This statement covers a total of 142 vessels with an aggregate deadweight capacity of 1,305,150 tons, an average of 9200 tons deadweight per ship.

Of these vessels, 33 are steam, 109 are diesel propulsion. Of the 76 vessels above 9500 tons deadweight included in the list, 69 are diesel and 7 are steam. All of the 33 steamers are to be triple expansion reciprocating.

The mass of construction is fairly well distributed over the shipyards of Europe. Only 4 of 142 vessels are building in America, the Sun Shipbuilding Company of Chester, Pennsylvania, having three and the Federal Shipbuilding Company of Kearney, New Jersey, one.

WHAT IS HAPPENING IN OIL

TONNAGE CLASSIFICATION OF
TANKERS UNDER CONSTRUCTION

AS OF FEBRUARY 1927.

CLASS	STEAM		DIESEL		TOTAL	
	NO.	D.W.T.	NO.	D.W.T.	NO.	D.W.T.
Under 7,500 D.W.T.	13	47,500	13	43,100	26	90,600
7,500 to 9,500 D.W.T.	13	106,000	27	228,750	40	334,750
9,500 to 10,500 D.W.T.	4	40,600	28	280,000	32	320,600
10,500 to 12,500 D.W.T.	3	34,875	18	201,400	21	236,275
12,500 to 14,500 D.W.T.	-	-	15	193,225	15	193,225
Over 14,500 D.W.T.	-	-	8	129,700	8	129,700
TOTAL	33	228,975	109	1076,175	142	1305,150

The large oil and oil products manufacturing and distributing corporations are keenly alive to the necessity for conservation of petroleum and economy in its transportation. This attitude is reflected in their choice of power plants for tankers. They have found that the diesel plant lends itself to quicker turn around and to larger cargoes.

Undoubtedly much of this tanker tonnage will be used to carry American oil and will be paid for with American money, and it would seem more equitable in a business sense that American shipyards should have more of this construction program. However, the conditions under which the American shipbuilder labors are such that he cannot bid in competition with European shipyards, and there is no incentive for the shipowner operating overseas to do so under the American flag.

This list of tanker construction presents in a very graphic way the tremendous importance of petroleum and its transportation overseas. In the industrial and maritime power plants of many sections of the world, oil is displacing coal very rapidly. Cost of ship time, train time, man time are more important items than cost of fuel and the use of oil fuel always cuts down all three.

This list of tankers will, when complete, represent an aggregate investment of well over one hundred million dollars. Such an investment certainly indicates that the oil experts do not look for any shortage of tanker cargoes in the immediate future and should set at rest some of the rumors that the end of the world's petroleum supply is "in sight" if not "at hand."

The tanker tonnage now in operation on the world's trade routes aggregates approximately 8,750,000 deadweight. It would therefore seem that the construction indicated by this list is adding 14 per cent to the world's tanker capacity. Since a considerable amount of the tanker tonnage now in use is obsolete and in many instances should be scrapped, this program will a little more than take care of the normal 10 per cent annual increase in the world's use of petroleum.

TYPE	D.W.T.	GROSS	OWNERS	BUILDERS	TYPE MACHINERY	RE
M/S	15,000	-	California Petroleum Co.	Sun Shipbuilding Co.Chester,Pa.	-	(
M/S	10,900	7,000	Compagnie Auxiliaire de Navigation	Atel.et Chant.Maritime du Sud Quest Bordeaux.	Burmeister & Wain,Tw.Sc. 4 stroke,6cyl.4,200ihp.	"Rh
M/S	10,900	7,000	" " "	" " " " "	Burmeister & Wain,Tw.Sc. 4 stroke,6cyl.4,200ihp.	"Ro
(2)	21,800		Total			
S/S	2,700	2,600	Curacaosche Scheep.Maats.	Cantiere Navale Triestino, Trieste	Triple expansion,Tw.Sc. 1,500 ihp.	
M/S	21,000	16,000	D.A.P.G.	Bremen Vulcan Sch.ird Mach.Vegesack	M.A.N.Si.Sc.2 stroke double actg.6cyl.4,300bhp.	
M/S	12,665	9,500	Danish Petroleum Co.	Burmeister & Wain,Ltd.Copenhagen	Burmeister & Wain,Tw.Sc. 3,800 ihp.	
S/S	8,500	5,900	European Shipping Co.	Swan Hunter & Wigham Richardson, Newcastle.	Triple expansion	
S/S	1,000	-	" " "	Greenock Dockyard Co.	-	
(2)	9,500		Total			
M/S	8,000	6,000	Messrs. Fearnley & Eger	Burmeister & Wain Ltd.,Copenhagen	-	
M/S	8,000	6,000	" " "	" " "	-	
(2)	16,000		Total			
M/S	6,500	4,800	French Navy	Atel-et Chant de la Seine Marit. Le Trait	Burmeister & Wain,Tw.Sc. 4 stroke,Si.Actg.6cyl. 4,100 bhp.	"Le
-	10,500	-	German owners	F.Schichau Werft,Danzig	-	
-	10,500	-	" "	" " "	-	
(2)	21,000		Total			
S/S	8,000	5,900	Cow Harrison & Co., Glasgow	Greenock Dockyard Co.,Greenock	Triple expansion	
S/S	8,000	5,900	" " " "	" " "	" "	
S/S	8,000	5,900	" " " "	" " "	" "	
S/S	8,000	5,900	" " " "	Lithgows Ltd., Port Glasgow	" "	
S/S	8,000	5,900	" " " "	" " " "	" "	
(5)	40,000		Total			
M/S	15,000	-	Gulf Refining Co.	-	-	
M/S	15,000	-	" " "	-	-	
M/S	15,000	-	" " "	-	-	
M/S	17,500	13,000	" " "	Federal S.B.Co.Kearny, N.J.	Bethlehem Tw.Sc.2 stroke Single actg.4,500 ihp.	[illegible]
(4)	62,500		Total			
M/S	9,300	6,500	Messrs.Halfdan Ditlev-Simonsen & Co.	Kockums Mekaniska Verkstads A/B "Malmo"	M.A.N.Si.Sc.2,650 ihp.	
M/S	13,000	9,000	Messrs.Halfdan Ditlev Simonsen & Co.	Burmeister & Wain Ltd.,Copenhag.	-	
M/S	13,000	9,000	" " " "	-	-	
(3)	35,300		Total			
S/S	10,000	6,900	Hindustan S.S.Co.Ltd.	Short Bros.Sunderland.	Triple expansion	
M/S	8,000	6,000	Holm & Wonsild	Burmeister & Wain,Ltd,Copenhagen	-	
M/S	15,600	11,300	Imperial Oil,Ltd.	Alex.Stephens & SonsLtd.Linthouse	Sulzer Tw.Sc.,2 Str. 4cyl.3,500 bhp.	
M/S	15,600	11,300	" " "	" " " "	Krupp Tw.Sc.Si.Actg.4cyl 3,500 bhp.	
S/S	3,500		" " "	Furness S.B. Co.Ltd.		
(3)	34,700		Total			
M/S	9,000	6,700	O. & A. Irgens	Eriksbergs Mekaniska Verkstads A/B., Gothenburg.	Burmeister & Wain,Tw.Sc. 6 cyl. 2,800 ihp.	
S/S	11,000	7,600	Sir Joseph Isherwood	Palmers S.B. & I.Co.Ltd.Jarrow	Triple expansion,Si.Sc.	
M/S	10,400	7,700	W.Jebsen	F.Schichau Werft,Danzig.	Sulzer,Si.Sc.6 cyl. 3,000 bhp.	
M/S	10,500	7,900	Johan Ludwig Mowinckels Rederi A/S	" " "	Sulzer,Si.Sc.6 cyl. 3,000 bhp.	"V
S/S	7,000	-	John I. Jacobs, Ltd.	Armstrong & Co.Ltd.	-	
M/S	8,300	6,000	A.F.Klaveness & Co.	Kockums Mekaniska Verkstads A/B "Malmo"	-	
M/S	8,300	6,000	" " "	Odense Staalskibsvaerft,Odense	Burmeister & Wain,Si.Sc. 3,000 ihp.	
(2)	16,600		Total			
M/S	13,000	8,900	Knut Knutsen, O.A.S.	Nakskov Shipyard Ltd., Nakskov	Burmeister & Wain, Tw.Sc. 4 stroke,Si.Actg.6cyl. 3,600 bhp.	
M/S	7,850	5,800	Laboremus Co.(Dannevig & Co.)	A/B Gotaverken,Gothenburg	Burmeister & Wain,Si.Sc. 6 cyl.2800 bhp.	"L El
M/S	12,000	8,700	"La Columtia" Sta.Marit.	Ansaldo San Giorgio, Spezia	Fiat.Tw.Sc.3,000 bhp.	"A 12
S/S	2,300	2,372	Lago Shipping Co.Ltd.	Harland & Wolff Ltd.Belfast	Triple expansion,Tw.Sc. 1,100ihp.	
S/S	2,300	2,372	" " "	" " "	Triple expansion,Tw.Sc. 1,100 ihp.	
S/S	2,300	2,372	" " "	" " "	Triple expansion,Tw.Sc. 1,100 ihp.	
S/S	2,300	2,372	" " "	" " "	Triple expansion,Tw.Sc. 1,100 ihp.	
(4)	9,200		Total			

TYPE	D.W.T.	GROSS	OWNERS	BUILDERS	TYPE MACHINERY
M/S	10,000	6,900	Lobitos Oilfields, Ltd.	Sir W.G.Armstrong Whitworth & Co.Ltd. Newcastle	Burmeister & Wain,Tw.Sc. 6 cyl.4,000 ihp.
M/S	8,000	6,000	Mr.Arthur H.Mathiesen	Elsinore S.B. & E.Co. Elsinore	Burmeister & Wain,Si.Sc. 6 cyl.2,600 ihp.
M/S	11,500	8,500	A.P.Moller	Odense Staalskibsvaerft Ved,Odense	-
M/S	8,200	6,000	"	" " " "	Burmeister & Wain,Tw.Sc.
M/S	12,400	8,900	"	Copenhagen Floating D.D. & Shipyard Copenhagen.	Burmeister & Wain,Tw.Sc. 6 cyl.3,200 bhp.
M/S	12,400	8,900	"	" " "	Burmeister & Wain,Tw.Sc. 6 cyl.3,200 bhp.
(4)	44,500		Total		
S/S	9,000	6,000	H.E.Moss & Co.	Palmers S.B. & I. Co. Jarrow	Triple expansion.
S/S	9,000	6,000	" "	" " "	" "
(2)	18,000		Total		
M/S	9,000	6,700	Norweigan Owners of Oslo	Odense Staalskibsvaerft, Odense	-
M/S	9,000	6,700	" " Haugesund	" "	-
M/S	13,000	9,800	Ocean S S A/S (J.P.Pedersen & Son)	Burmeister & Wain Ltd.,Copenhagen	Burmeister & Wain,Tw.Sc. 4 stroke Si.Actg.2,800 ihp
M/S	9,000	6,700	" " "	" " "	Burmeister & Wain,Tw.Sc. 6 cyl.4 stroke,Sing.Actg. 2,960 bhp.
(2)	22,000		Total		
S/S	3,000	2,100	Pet.Industrie Maats	Furness S.B.Co.Haverton-Hill	Triple expansion.
M/S	800	600	Raffineries du Midi	Soc.Anonyme des Chant Generaux, Cette	Deutz,Si.Sc.525 ihp.
M/S	9,000	6,700	Rederi A/B Concordia (Mr. Justus A. Waller)	A/B Gotaverken,Gothenburg.	Burmeister & Wain,Tw.Sc. 4 stroke,Si.Actg.2,800 ihp.
M/S	8,000	5,000	Soc.D'Armement d'Industrie et de Commerce	Soc.des Atel.et Chant.de France, Dunkirk.	Sulzer,Tw.Sc.2 stroke, 2,800 bhp.
S/S	10,000	7,000	Soviet Pet.Syndicate	Martg.S.B.Yards,Nicolaieff	-
M/S	9,000	6,700	Mr.Sverre Sturland	A/B Gotaverken, Gothenburg	-
M/S	12,000	-	Sun Oil Co.	Sun S.B.Co. Chester, Pa.	-
M/S	13,000	-	Swedish Owners	-	-
M/S	10,900	7,000	Syndicate du Napthe de U.R.R.S.	Chant.Navale Francais,Blainville(Caen	Sulzer,Tw.Sc.2 stroke, 4 cyl.5,000 ihp.
M/S	10,900	7,000	" " "	" " " "	Sulzer,Tw.Sc.2 stroke,4 cyl.5,000 ihp.
(2)	21,800		Total		
M/S	13,000	-	Tide Water Oil Co.	Sun S.B.Co. Chester, Pa.	-
M/S	7,700	5,100	Tonsberg Rederi A/S	J.Barclay Curle & Co.Ltd.Scotstoun	N.Brit.Diesel Si.Sc.2 stroke 3 cyl.double Actg. 2,000 ihp.
M/S	7,700	5,100	" "	" " "	N.Brit.Diesel Si.Sc.2 stroke 3 cyl.double Actg. 2,000 ihp.
(2)	15,400		Total		
M/S	13,000	9,800	Trelletorgs Augfartygs Myra.A/B	Kookums Mekaniska Verkstads A/B "Malmo"	M.A.N.Tw.So.4 stroke
M/S	13,000	9,800	" " "	" " " "	M.A.N.Tw.Sc.4 stroke
(2)	26,000		Total		
M/S	12,500	8,782	United Molasses Co.Ltd.	Furness S.B.Co.Ltd.Haverton Hill	Burmeister & Wain,Tw.Sc. 6 cyl.4 stroke Single Actg.
M/S	12,500	8,782	" " " "	Wm.Hamilton & Co.Ltd.Port Glasgow	" " "
M/S	13,500	9,700	" " " "	Swan Hunter & Wigham Richardson, Wallsend	Neptune,Tw.Sc.2 stroke 6cyl. 4,000 bhp.
(3)	38,500		Total		
S/S	12,300	8,600	Vacuum Oil Co.Ltd.	Lithgows Ltd., Port Glasgow	Triple expansion,Si.Sc.
M/S	8,500	6,700	Phs.Van Ommerens	Rotterdam D.D.Co.Ltd.Rotterdam	Burmeister & Wain,Si.Sc. Single actg.8cyl.2,500ihp.
M/S	5,500	4,620	" "	C.van der Giessen Zonens Sheeps	M.A.N.Si.Sc.4 stroke single actg.6cyl.1,850 bhp.
(2)	14,000		Total		
S/S	5,000	3,500	Venezuelan Gulf Oil Co.	Palmers S.B. & I.CO.Ltd.Jarrow	Triple expansion Tw.Sc.
S/S	5,000	3,500	" " " "	" " " "	Triple expansion Tw.Sc.
S/S	5,000	3,500	" " " "	" " " "	Triple expansion Tw.Sc.
(3)	15,000		Total		
M/S	8,000	6,000	Waage Shipping Co.	A/B Gotaverken,Gothenburg.	Burmeister & Wain Si.Sc. 6 cyl.2,800 bhp.
M/S	10,500	7,900	Westfal Larsen & Co. a/s	F.Schichau Werft,Danzig	Sulzer,Si.Sc.6cyl.3,000 bhp.
M/S	10,500	7,000	Westfal Larsen & Co. a/s	Atel-et chant de la Seine Marit. Le Trait	Burmeister & Wain,Si.Sc. 8cyl.Si.Actg.4,250 ihp.
M/S	12,900	9,350	Westfal Larsen & Co. a/s	Netherland S.B.Co.Amsterdam	Werkspoor,Tw.Sc.4 stroke 6cyl.Single actg.4,280 bhp.
(3)	33,900		Total		
M/S	10,500	-	-	A/S Helsingfors Jernskibs og Mask.	-
-	8,000	-	-	" " " " "	-
M/S	10,500	-	-	Swan,Hunter&Wigham Richardson,Ltd.	-
-	9,000	-	-	A/B Gotaverken,Gothenburg	-

TOTAL NUMBER TANKERS 142 TOTAL D.W.TONNAGE 1,305,150.

The Sewall "Big Four," III

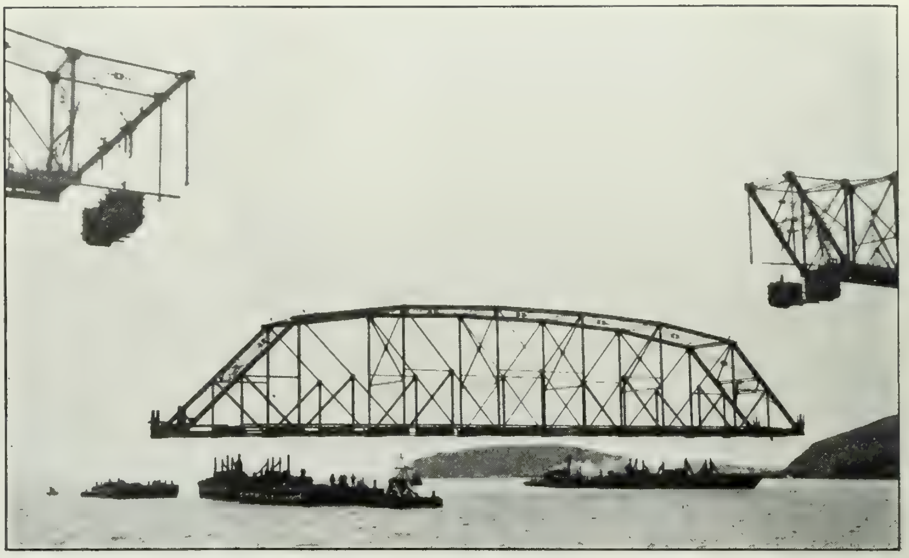
(Continued from Page 210)

which the following day found the mate's boat. All the occupants were landed at San Cristobal, Solomon Islands. The second mate's boat reached Santa Ana, also one of the Solomon Group, where the crew landed and occupied a hut belonging to an ex-chief. One account said that this man died shortly afterwards, and his death being attributed to the presence of the whites, the latter were obliged to take to their boat and again put to sea. Another account was that the men were kindly treated until their stock of tobacco gave out, when the son of a chief warned them that their lives were in danger. After putting to sea they were picked up by a schooner and landed at Gabuta where the rest of the Susquehanna's company were. Eventually they reached Sydney by steamer, and everybody went his way. Captain Watts and mate Stinson arrived at San Francisco December 6, 1905, on the Sonoma.

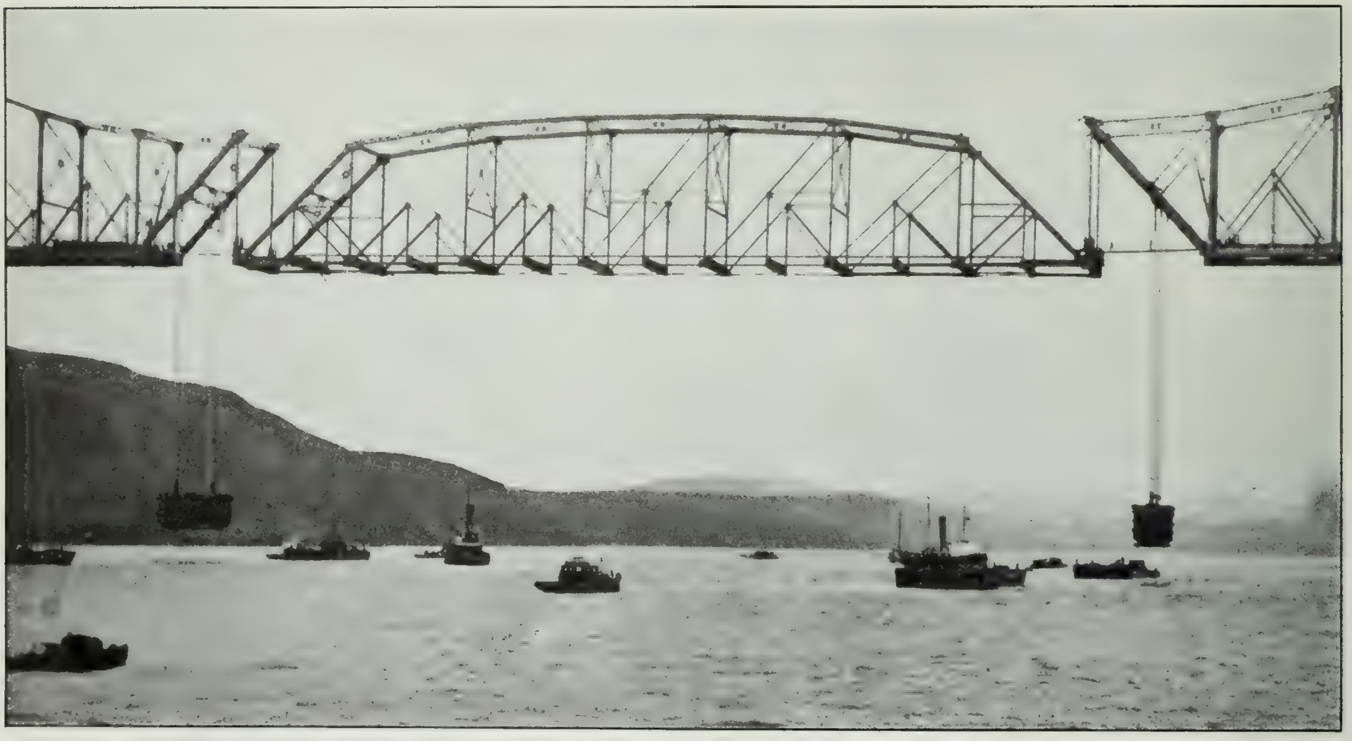
The first master of the Susquehanna was Captain Joseph E. Sewall, who left to take command of the new steel ship Edward Sewall belonging to the same owners. He was succeeded by Captain Bailey who had been mate of the Erskine M. Phelps. In 1904, Captain E. A. Watts, who had been in the John McDonald, Pactolus, and Shenandoah, took the Susquehanna and continued in her until her end.

Spectacular Engineering Stunt

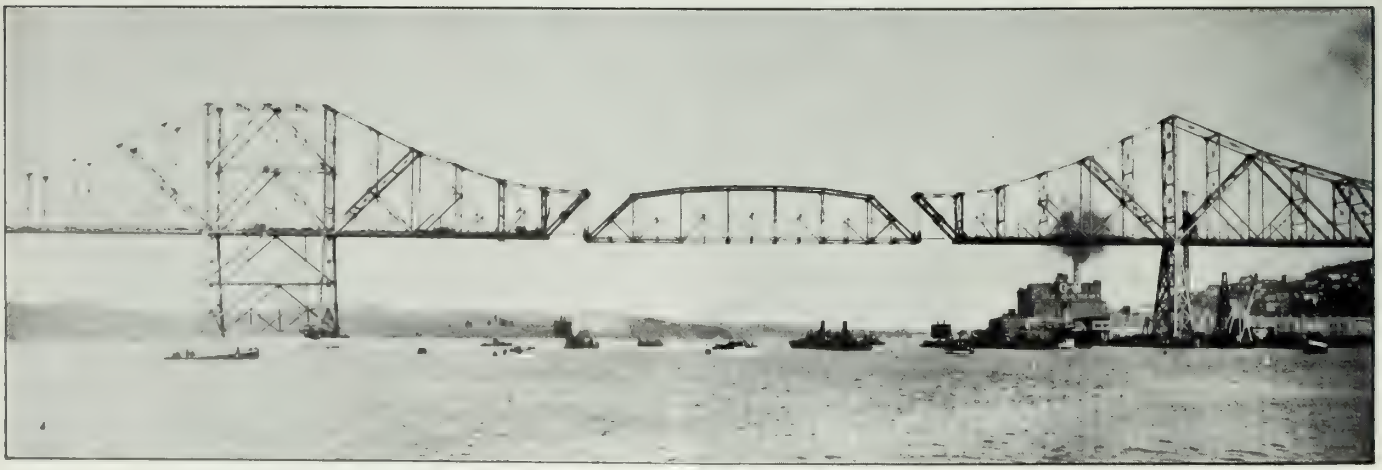
Erecting Carquinez Bridge



North span of Carquinez Bridge just clearing the barges.



The north span of the bridge in place. Note the workboats on the job.



South span of the bridge in place, completing the connection.

Bridging Carquinez Strait

One of the World's Greatest Bridges Now Ready for Traffic over San Francisco Bay

CARQUINEZ Strait, the narrow body of deep water uniting the San Pablo and Suisun arms of San Francisco Bay, has always been an obstacle in overland transportation.

Long ago the Central Pacific Railroad established there, from Benicia to Port Costa, the world famous railroad ferry, that smooth-working organization which always surprises the passenger into exclaiming, "How in the world did they get this train onto the boat?" The strait is several miles long and from one-half to three-quarters of a mile wide. It is a great water highway into California's interior valleys and carries a rich annual commerce from the river ports to San Francisco for transshipment to the world's markets. Crockett, home of the world's largest sugar refinery, Port Costa, an important grain shipping port, and many other ports and landings of considerable importance are dotted along the shores of this waterway.

One of California's main highway arteries is blocked by Carquinez Strait, and several automobile ferries have made rich earnings serving the stream of vehicle traffic.. The American Toll Bridge Company, under the guidance of the late Aven J. Hanford, was organized for the purpose of building a bridge to take care of the vehicular traffic, and after overcoming many obstacles is now about ready to open the longest and highest highway bridge in the world.

This bridge, with its approaches, covers a total length of 4482 feet. Starting at its south end on a level 122 feet above mean low water level, 1132 feet of steel viaduct reaches the inshore end of the first cantilever anchor span, which is 500 feet long to the center of the south pier. From this point to the central pier group is a clear span of 1100 feet. The pier span in the central group is 150 feet. Then comes another 1100-foot span to the north pier and a 500-foot anchor span to the abutment on the north shore.

The floor of the bridge rises on a grade so that the clearance is 135 feet at south pier, 150 feet at the north side of the central piers, and 158 feet at the north pier. The rock foundation for these piers averages about 150 feet below the surface, and as the tidal currents are very swift, the setting of cofferdams and the excavation of the clay bottom presented tremendous difficulties. These were successfully overcome through the ingenuity of Charles Derleth, Jr., chief engineer of the American Toll Bridge Company, and through the resourcefulness of Duncanson-Harrelson Co. of San Francisco and the Missouri Valley Bridge & Iron Company, contractors for this phase of the construction.

The superstructure was erected on these piers by the American Bridge Company department of the United States Steel Products Company. While possibly less difficult than the sinking of the foundations, this work has been far more spectacular and in its completion has staged two very notable displays of engineering skill in the raising of the two girder spans connecting the three cantilever trusses.

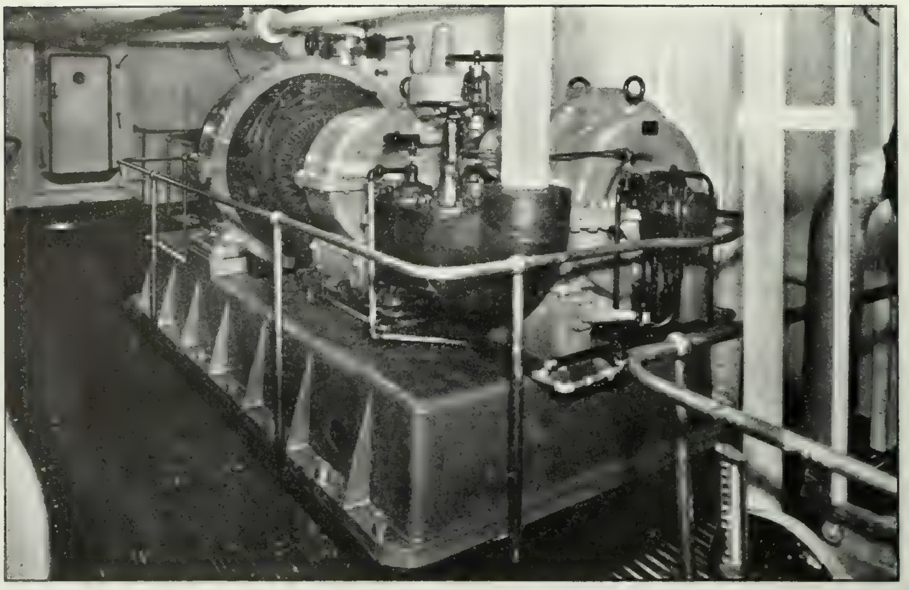
The girder spans are each 433 feet long and 40 feet wide, with a net weight slightly under 700 tons. They were built on a pier, floated on specially constructed barges, towed into place directly under the gaps in the superstructure of the bridge, and raised into place by counterweights as simply, to quote E. J. Schneider, sales manager of the United States Steel Products Company, "as raising a window sash and by the same method."

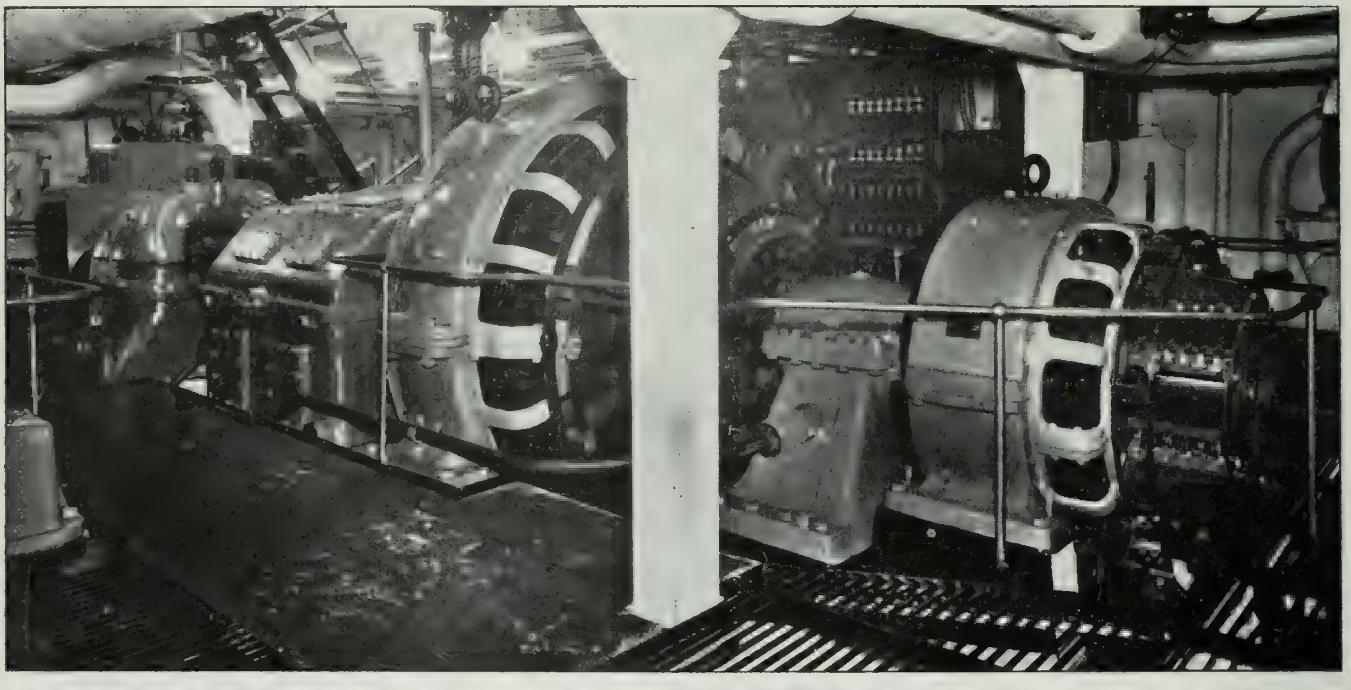
Briefly, the procedure was as follows. Four boxes were built to hold 200 tons of sand each. These boxes were coupled together in pairs, each pair making a 400-ton unit. One of these units was placed on the south end of the north cantilever truss and one on the north end of the central cantilever truss. To each of these units were attached two 2½-inch special core steel cables supplied by the American Steel and Wire Company. These cables were run up and over steel sheaves of 5 feet 3 inches diameter inserted in the top members of the cantilever arm, and then down to each corner of the girder span to be lifted. A hoisting engine at each end was geared directly through multiple sheaves onto the counterweights to effect braking action if found necessary. These arrangements being completed, a picked crew of men was thoroughly drilled in the necessary routine, a system of signals was adopted, a telephone connection was installed, and the stage was set for the great effort. From the projecting overhang of the cantilever at each end of the gap were swung two eye bolts with 12-inch diameter eyes. On each extreme corner of the girder span was a 12-inch hole. On the floor at the end of the cantilever trusses at each end of the gap were two 12-inch diameter by 38-inch long special steel pins ready to be slipped into position when the holes registered.

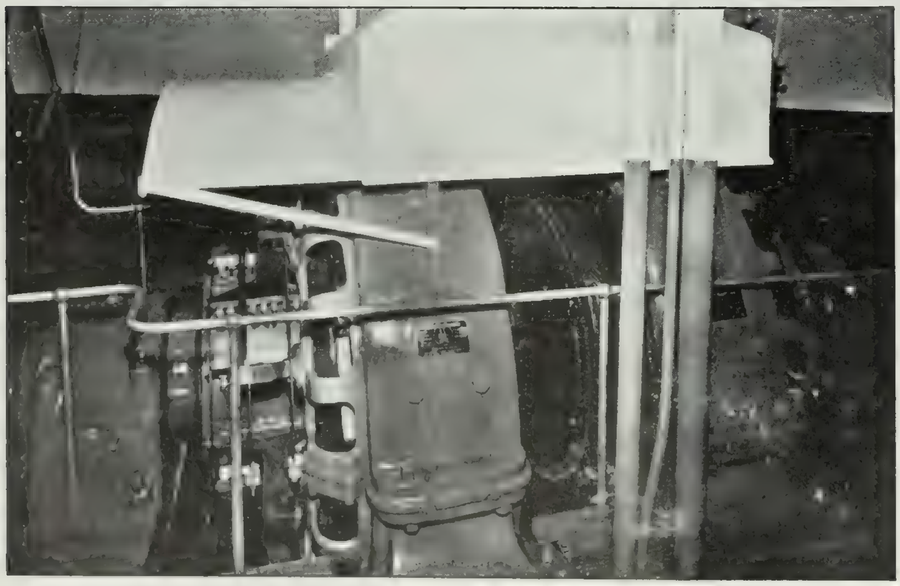
At a word from K. L. Strickland, division erection manager of the American Bridge Company, Frank Stangle, superintendent of construction, gave the signal, the span rose gradually and steadily into place, the steel pins were slipped home, and the north end of the big bridge was ready for the construction gang to complete the steel work. Three weeks later the performance was repeated at the south gap, and the steel structure is now finished. The slab concrete floor is being rapidly laid by Duncanson-Harrelson Co., and the bridge will be open for traffic about June 1.

Like all engineering feats, this raising of the spans is very simple in its execution and in its story. Back of it lies the skill gained through long years of experience and training, not only on the part of the engineers in charge, but also in the matter of the equipment used and on the part of the manufacturers of that equipment. In fabricating the superstructure of the bridge, 14,000 tons of steel shapes were used, and no flaws developed. In handling the 700 tons' weight of the suspended girder, only 18 inches total stretch was observed in the new 2½-inch steel cable. Five Crowley tugs from San Francisco, with numerous barges were used, and the personnel in charge of this floating equipment performed their roles with prompt efficiency.

Power Plant of a Modern Ferry







This power plant as installed in the two new San Francisco-Oakland transbay passenger ferryboats Yerba Buena and Peralta of the Key System Transit Company, is being admired by thousands of visitors to the central station, boiler rooms, and motor rooms of these vessels. Our illustrations, made from photographs by Ford Samuels of Oakland, show the principal electric units. Above is shown the Westinghouse 200-kilowatt auxiliary and emergency turbo-generating set. This is located in the central power station. The middle picture shows the main Westinghouse turbo-generating plant which provides propulsive power for the vessel. Below is shown one of the Westinghouse double armature propulsion motors. Steam for the turbines is provided by four Babcock & Wilcox water-tube boilers. One very novel feature of this plant is the continuous one-level platform from the forward motor room through forward boiler room, central station, after boiler room, and after motor room. This platform is on the water line level. Hibbs, McCauley and Smith of San Francisco are the designers, and the vessels were built by The Moore Dry Dock Co. A complete description will be found in Pacific Marine Review for March.

Vehicular Ferryboat Golden City

The Steam Ferry Aven J. Hanford of the Golden Gate Ferry Company Converted to Direct Diesel Propulsion at the Yard of the Ferry Company by the Installation of a 600 H.P. Washington-Estep Diesel Engine

THE diesel ferryboat Golden City formerly the steamer Aven J. Hanford, after a very successful and enjoyable trial trip and a few days of efficient service, was sunk in collision with the steamer Newport at 7:50 p.m. Sunday, April 24. Her hull now lies somewhere just outside the Golden Gate under about 350 feet of water.

Her conversion from steam to diesel power was an interesting job, and we therefore set forth here the story of that conversion and of her successful operation just as we would have written it if the Golden City were still afloat.

The steamer Aven J. Hanford was powered with one of the fine triple expansion engines from the old U. S. torpedo boat Farragut, built at the Union Iron Works, San Francisco, in 1899. This engine was a high speed, short stroke skeleton model with a light bedplate. As set in the Aven J. Hanford, the center line of the propeller shaft driven by this engine was only 18 inches above the top of the keelson. The shaft was continuous, both bow and stern propellers being driven at the same speed. In conversion to diesel, it was specified that clutches be installed to allow the forward propeller to idle. The special problem involved, therefore, the raising of the center line of crank shaft above the center line of propeller shaft so as to accommodate these clutches and the heavy bedplate necessary to insure rigidity of the diesel engine cylinder alignment.

The contract was taken by the Washington Iron Works of Seattle, represented in San Francisco by W. H. Worden & Co. A special subbase was designed, as shown in the view reproduced herewith, and on this were mounted two gear cases, two clutches, and a 6-cylinder Washington-Estep diesel engine of 600 brake horsepower at 190 revolutions a minute. The subbase raises the center line of crank shaft 18½ inches above the center line of the propeller shaft.

In designing the gear box, the Washington-Estep engineers very wisely took advantage of the opportunity to secure a more economical propeller speed, and introduced a reduction ratio of 31 to 25, giving a propeller shaft speed of 152 revolutions a minute.

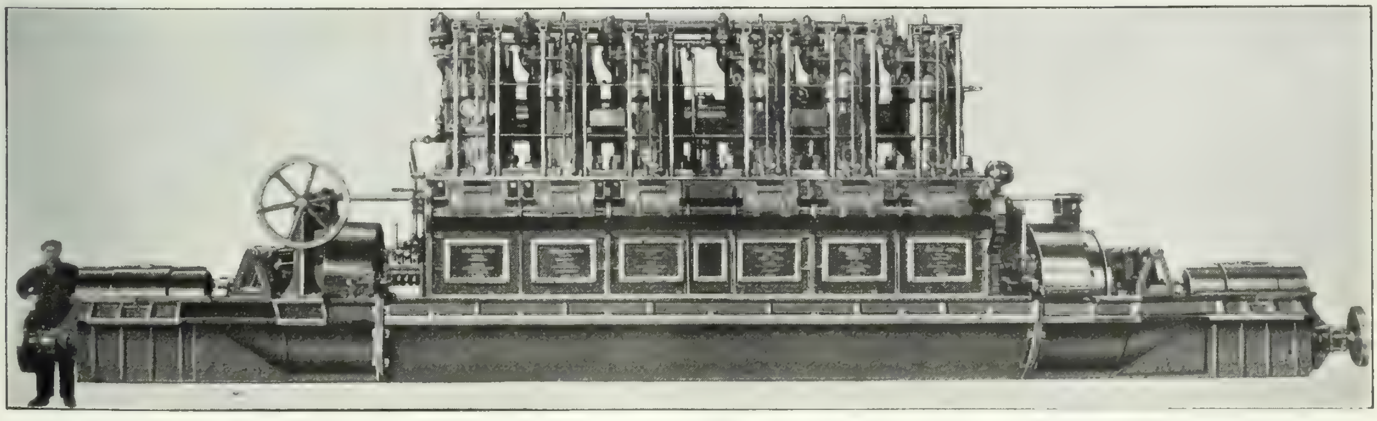
The engine used was the largest diesel ever installed on a San Francisco Bay ferryboat. Six cylinders of 17-inch diameter and 24-inch stroke, working at a compression of 360 pounds and a brake mean effective pressure of 73 pounds produce 600 brake horsepower. The over-all dimensions were: length over couplings, 43 feet; length over engine, 21 feet 6 inches; height above center line of crank shaft, 9 feet 11-3/8 inches; height above center line of propeller shaft, 11 feet 5-7/8 inches; width over-all, 6 feet 7 inches; weight of engine, 142,000 pounds; weight including clutches and gears, 190,000 pounds.

The clutches were worked by a handwheel at the control stand through a system of shafts and interlocking gear. On the trials the Golden City averaged a little under 12 knots over the measured mile and she maneuvered and reversed with great facility.

A 16-horsepower Colo diesel engine, direct-connected to a Westinghouse direct current generator, supplied electric light and auxiliary power. An extension on the shaft of this generating set was connected through a clutch to the shaft of a Gardiner compressor for supplying starting air.

This Washington-Estep diesel plant gave promise of demonstrating very remarkable fuel economy. The old steam plant on this boat was a heavy oil consumer, and the new Washington-Estep diesel installation was so improving her record that her owners could count on saving about four-fifths of the fuel formerly used.

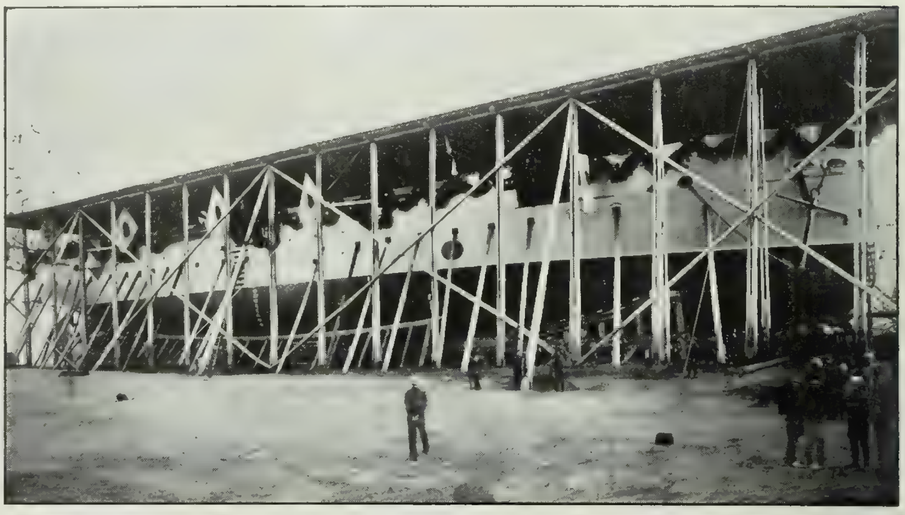
In connection with the sinking of the Golden City, it is to be noted that this vessel was not equipped with direct pilot house control.



Washington-Estep 600-horsepower, 6-cylinder, solid injection, directly reversible, marine type diesel engine, with clutches and gears mounted on built-up bed plate, as installed in the ferryboat Golden City for the Golden Gate Ferry Company.

Pioneer Modern Shipbuilding in Japan

By Robert Clark.



The composite gunboat Yamato Kan ready for launching, May 1885, at the Imperial Navy Yard, Kobe.

THE accompanying photos of the Imperial Naval Yard Ono Hama, Kobe, were taken in May, 1885, just a few days before the launch of the Japanese gunboat Yamato Kan and a small merchant vessel for the coasting trade.

The Yamato Kan was a composite auxiliary single-screw steamer of about 1500 tons displacement, 200 feet long by 35 feet beam, with a mean draft of 16 feet. She was built to plans and specifications copied from English builders who had previously built similar vessels for the Japanese Government, and of course, the vessels had to be built under a roof the same as they did in England.

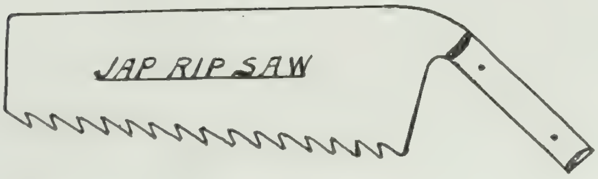
The other vessel in the foreground of the picture was an iron single-screw steamer of about 500 tons deadweight. Her dimensions were 160 by 27 by 12 feet.

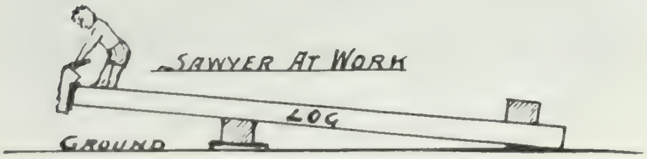
The small craft between these two vessels was a wooden yacht about 40 by 12 by 6 feet draft, with a displacement of 25 tons, sloop or cutter rig, built to the order of Mr. Craigh, proprietor of the Kobe Daily News, for his own use.

The two vessels decorated with evergreen shrubbery all around, were launched the same day with just a brief interval between them, and the yacht about a month later.

The launch of the Japanese gunboat Yamato Kan was a great gala day in the Ono Hama yard. All the leading naval officers were there in full dress regalia, and the program for the occasion was carried out with great dignity and precision, very much like a funeral, slow and decorous. On the other hand the men in the yard were running around like a lot of sheep, frantically knocking down shoes and driving out keel blocks, regardless of all orders previously given to leave in a few keel blocks, especially near the forward end.

The mob started at the stern and cleared out everything as they went, leaving the vessel entirely on the launch ways long before the officials were through with their program. It was a wonder she did not burst the dog shoes long before they did give out. As it was, they just held until the word was given to go, and she went at once, making a very pretty launch, leaving the ways without a quiver. She glided gracefully along like a duck on the water, until the anchor was dropped about half a mile out on the bay.





The peculiarity of conditions existing in this locality necessitated very careful consideration to bring about a successful launch. First of these was the small variation in the rise and fall of the tide, which is only 3 to 4 feet at most. Then there was the slow inclination or declivity of the beach, necessitating an unusual length of ground ways before depth of water was obtained sufficient to float the vessel. Dredging could not be considered. The next best thing to do was to build or tie together about 100 feet of ways, which was done on the beach in the yard close by the vessel. Of course these launch ways had to be ballasted and sunk in position; so the cross tie planks were cut long enough to stand outside of the ways about 2 feet to give stability and carry the ballast made up of chains. A few days before the launch the ways were finished and rolled down the beach into the water. (Hard wood rollers were kept in stock for such work.) They were then lined up with the ways under the bottom of the vessel and secured in that position by stakes or small piles driven along the inside edge of the ways. The ground under them was carefully examined and cleared of any boulders likely to prevent the cross sleepers or ties under the ways from getting down solidly on the beach. The ballast was then evenly distributed along each side in sufficient quantity to assure us they would stay put when sunk.

In the execution of this work, the enthusiasm and energy displayed by the Japanese carpenters and helpers was very remarkable. They worked like beavers, in the water, running out and in it up to their waists, even diving occasionally to make sure the ways were all right.

However, they were well equipped to do this kind of work. Their clothing, or rather want of it, as usual almost nude, helped wonderfully. They did not have to go home and change, but just ran out on the beach and stood beside a bonfire a little while, and perhaps drank a little hot water, which was kept in a pot on the fire for them. (Japanese prefer hot water even in summer, being very subject to colic.) They were then all ready for another go.

Regarding the construction of this composite vessel, iron work frames and stringers were exceptionally heavy and substantial, carefully fitted and rivetted together. All Japanese labor was employed, directed by an experienced ship fitter from Scotland, Clyde district, who naturally saw that they were equipped with the latest plant machinery and tools then used by British builders, such as furnace and slabs for frame bending and beveling, plate rolls, punching and shearing machines. They also had a blacksmith shop, foundry, boiler and machine shop, with a first-class experienced foreman in charge of each of them, besides an office force of Europeans, including draughtsmen for all kinds of work in ships and engines.

The keel, and stem and stern posts were of kiyaki, a native wood similar to English elm. It was faced with teak when in contact with iron. The rudder and body posts were connected to the keel as usual with a hollow brass casting, average thickness of webs 1 to 1¼ inches. The drawing, pattern work, molding, casting, and finishing were all done by Japanese and turned out to be a fine job.

The outside shell or sheathing of bottom and sides of this vessel was in two thicknesses of wood, each 3 to 3½ inches thick. The inner sheathing next to the iron framing was teakwood imported from Bangkok, Siam, in square logs about 26 to 30 feet long by 10 to 14 ins. square. The outside sheathing was of kiyaki, a native wood of Japan, which also was delivered in square logs about the same length and size as the teak logs. The work of ripping them into planks was done in the shipyard by Japanese sawyers in their own old-fashioned way, without any modern equipment, not even a saw pit. Each man had his own saw, made in Japan, of course. It was a rough looking blade of steel with the marks of the hammer still on it, but of a good quality and finely tempered.

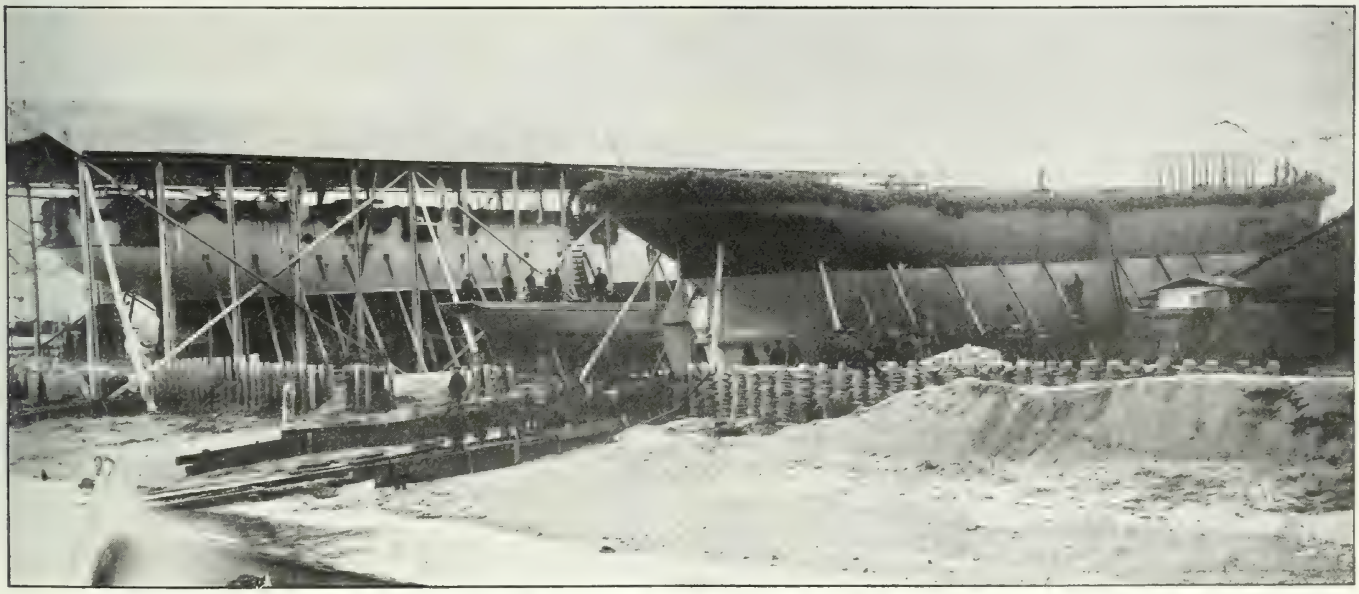
When they started work in the morning, every man sharpened his own saw, without a bench or vise to hold it. He simply sat down on the ground in any convenient place, crossed his legs as our tailors do at work, and, with his saw in one hand and a small flat file in the other, carefully sharpened each tooth. The saws they used for this kind of work were of unusual proportions, wide or broad and short, not over 26 inches long and tapered from 6 or 7 inches at the point to about 9 or 10 inches at the handle. A cross section of the saw was wedge shaped, about ¼ inch thick on the face to 1/8 inch at the back. The handle is an extension of the blade about 2 inches wide by 6 or 7 inches long, with a half round piece of wood each side.

To get along without a sawpit, they just lift one end of the log about 2 feet above the ground by placing a block near the middle of it, leaving the other end on the ground.

This antiquated method of doing this work was not the choice of their employers, but was the result of the men's antipathy to the use of machinery.

A few years prior to this time, the proprietors of this establishment, known then as the Kobe Iron Works, put in a modern sawmill plant, expecting, of course, to get the usual results, a saving of time and expense in doing that kind of work. But to their great chargin they found the opposite was the case. It was costing a great deal more to keep the machinery in repair than the work was worth, and they were forced to give it up and fall back on the old slow way of sawing. Evidently the Japanese are not much different from the rest of us. It is the same old controversy that has been thrashed out the world over, regardless of race or color. Men naturally cling to what they have learned to do well for a living, even if it is hard work, providing it pays to do it. The sawyers earned more money than the ship carpenters, but of course worked harder. They were paid for the work they did and not for the time spent on it, which is an ideal system that should be adopted wherever practicable. These sawyers were paid 1½ sen per foot cut and usually cut 60 to 80 feet a day, which made their pay 75 to 90 sen; while the carpenters were getting 40 to 50 sen a day. So it appears there was method in their madness when they wrecked the sawmill machinery. Had they not done that they would very likely have had to drop their saws, and the big money they made with them, and work as helpers in the mill or elsewhere for less than half they earned sawing.

The ship carpenters were, generally speaking, very proficient workers, considering the kind of tools they had to work with.



View of the Imperial Navy Yard at Kobe, May 1885, showing iron single screw cargo steamer, wooden yacht, and gunboat ready for launching.

Whaling Up-to-Date

Some Notes on a Pacific Coast Floating Whaling Station

Large section of whale hanging on Lansing's gear

THE California Sea Products Company of San Francisco is carrying on the business of whaling in the Pacific in a manner that would certainly be very startling to any of the old New Bedford or Nantucket whalers could any of those worthies ascend or descend to be an observer on the after deck of the whaling ship Lansing.

The whaling industry has never been dead on the Pacific Coast. It has, like all other industries, seen its periods of deflation and depression, but there has always been some whaling carried on from shore stations and at sea since the days when the whaling industry of New England was sending its ships to all the far corners of the earth in search of sperm oil that our forefathers might have light.

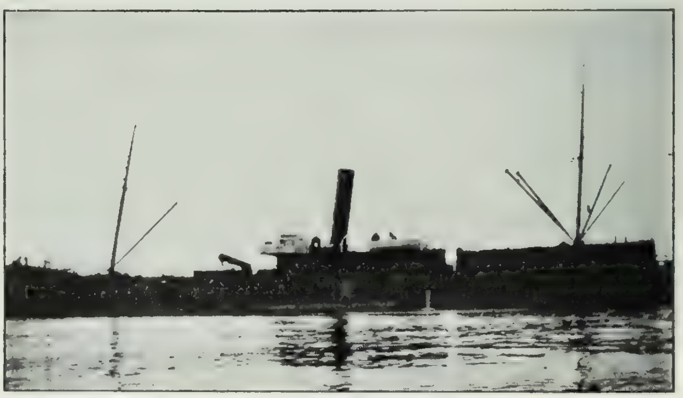
The steamship Lansing, referred to above, was a tanker formerly belonging to the Union Steamship Company. She is 400 feet long, 47 feet beam, 47 feet 9 inches molded depth, and was built in 1890 at Palmers yard, Newcastle-on-Tyne, England. She is powered with a triple expansion engine and two double-ended Scotch boilers fitted for burning oil fuel. She was purchased by the California Sea Products Company and converted into what is said to be the only floating whaling station in America.

Whale's carcass on after deck of Lansing.

As shown in our illustration, the whales, which are harpooned and caught by smaller vessels, are towed alongside the Lansing and are lifted by heavy boom and rigging onto the after deck superstructure. Here the carcass is cut up and the bones and meat are dropped into vertical retorts, or steam cookers, which are installed under the after deck. These steam cookers render the oil out of the meat and the bones. This hot oil, containing in suspension a considerable quantity of glue water and the finely divided meat particles, drains into a storage tank. This tank is also equipped with steam coils so that the mixture in it may be heated or kept hot at will. From the storage tank, by a system of piping, the mixture passes in either one of two routes. First, it can be taken from the storage tank directly through a motor-driven No. 600 De Laval oil purifier, which is installed complete with the De Laval 10-minute cleaning device. Second, the mixture can be passed from the storage tank into a three-compartment cooling and separating tank. This tank is so constructed that the oil mixture feeds from the first compartment to the second compartment at the bottom of the tank, and from the second compartment to the third compartment at the top of the tank. The mixture may be taken from any one of the three compartments of the tank to the De Laval oil purifier.

Whales floating alongside awaiting their turn to be cut up for oil.

A busy scene on the Lansing's deck showing whale's carcass being cut into sections suitable for the steam cookers.



The steam whaler Lansing. Note raised superstructure aft.

The whale oil mixture is passed through the purifier in order to remove from it the meat and glue water, which, if left in the oil mixture, would build up the fatty acid content rapidly and soon render the oil very offensive in odor and of much less value commercially.

It has been found, in the working of this plant, that when the oil mixture is passed through the De Laval oil purifier in quantities approximating 8 barrels an hour, the mixture is dehydrated and all meat and sediment are eliminated. The ingoing mixture carries, on the average, from 2 to 5 per cent glue water in suspension. This water, when thrown out in the bowl, carries with it the finely divided particles of meat in the form of sludge. The glue water and sludge discharged from the purifier are pumped overboard and the pure oil runs by gravity to suitable storage tanks below the deck.

This installation of De Laval oil purifier is another application of scientific method in making commercially profitable under modern conditions one of the ancient and honorable callings of the sea.

View of the top of the superstructure deck aft on the Lansing showing covers for steam cooking tanks.

Pacific Coast Impressions

American Bureau of Shipping Executive Sees Great Future for Marine Commerce on Pacific Coast

By C. A. McAllister, President, American Bureau of Shipping

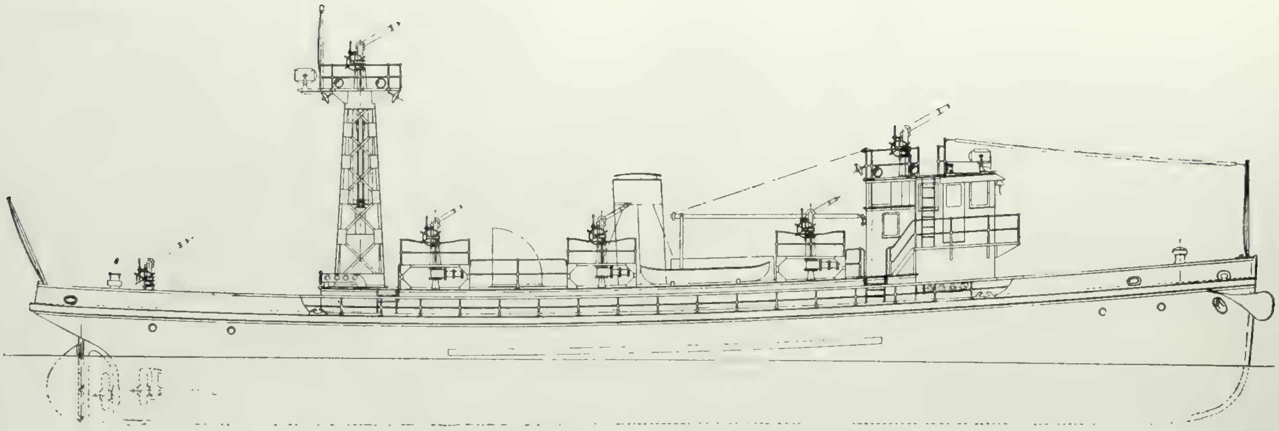
HAVING just completed a tour of the principal seaports of this Coast, I feel more than ever convinced that the Pacific Ocean and our Pacific states will form the theatre of our greatest industrial development in the next half century. The enormous population in countries on the Pacific in South America, Asia, Australia, and the innumerable South Sea islands must inevitably furnish the greatest opportunities for trade in American products. The gateways for this wonderful potentiality in trade must be your seaports of San Francisco, Los Angeles, Seattle and Portland.

The American standard of living in comforts and luxuries is the envy of all these, as yet, undeveloped masses. American travelers with their seemingly unlimited funds have sown the seed for emulation of our neighbors on this great ocean. In this respect we must not underrate the propaganda value of one of California's great industries, the moving picture. I have traveled considerably in the past three or four years, and have yet to find a foreign city where the American movies were not to be seen, and favored above all others. Very subtly the idea of securing American motors, food, furniture, radio apparatus, and others of our comforts and luxuries is implanted in the minds of the movie audiences. The Shipping Board by providing for fast and comfortable ships to hitherto remote places bordering on the Pacific and India Oceans, accomplished much in extending our market. It is almost axiomatic that our trade can not be properly expanded by using the ships of our rival commercial nations. I am more than pleased to find out here a freedom from entangling alliances with foreign shipping, such as exists to a large extent in certain of our Eastern seaports.

In the coming great commercial expansion on the Pacific, ships owned, built, and operated by Americans must necessarily play a most important part in your development. I do not think it will be very long before some of our Pacific Coast shipyards will again resume their activities. One of the most surprising things I have learned during my visit here was the fact that wrought steel anchors made out here are shipped in quantities to New England and other parts of the East, and that diesel engines made on this coast are being sold for use in New York Harbor. A little more encouragement from the government will place the shipyards here on an even competitive basis with other parts of the country. The last Congress in the closing hours of the session passed a very important measure, in extending the so-called Construction and Loan Fund for the Shipping Board, whereby money for the construction of American ships for the foreign trade can be borrowed by shipowners at 4½ per cent. This was put through largely on account of the efforts of two Pacific Coast men, Senator Jones of Washington and Congressman Arthur Free of California. Eventually this loan rate should be reduced to 3½ per cent, which will give American ships an opportunity to compete with foreign vessels on a par. Give American shipping free tolls through the Panama Canal, a 3½ per cent loan fund, build your Boulder dam to increase the productivity of Southern California, and you will find American shipping on this coast will rise to meet the demands of the forthcoming great expansion of trade.

Rapid Discharge of Silk

AGAIN breaking all former records for San Francisco in the rapid discharging of silk, the General Steamship Corporation on January 3 demonstrated the astonishing speed that is possible in handling this valuable cargo when effort is properly coordinated. As soon as the Kawasaki express liner Norway Maru was brought alongside Pier 39 at 9:03 a.m., the first bale was being unloaded. At 1:25 p.m., the last of the 2900 bales was unloaded, and exactly one minute later, the entire shipment was safely loaded in Southern Pacific express cars. Four minutes thereafter—at 1:30 p.m.—the train was being pulled away from the dock, ready to start on its rapid eastward journey.



Outboard profile of Seattle's new fireboat.

New Fireboat for the City of Seattle

Pacific Coast Engineering Company Building Steel Hull to House Winton, Byron-Jackson Fire Fighting Equipment for Puget Sound

AT THE yard of the former Union Construction Company at the foot of Fourteenth Street, Oakland, California, the Pacific Coast Engineering Company is building a fireboat designed by C. W. Nickum, naval architect, for the City of Seattle, which has several novel and interesting features of construction and equipment.

This boat will be of all steel construction with power furnished by Winton gasoline engines and with water streams impelled by Byron-Jackson centrifugal pumps.

Her principal characteristics are:

Length over-all	123′ 6″
Length between perpendiculars	18′ 0″
Beam, molded	26′ 0″
Beam, over guards	27′ 0″
Draft	7′ 6″
Speed, knots	14
Gasoline bunker capacity, gallons	5500

She will be built to special survey classification for Lloyds and the American Bureau of Shipping.

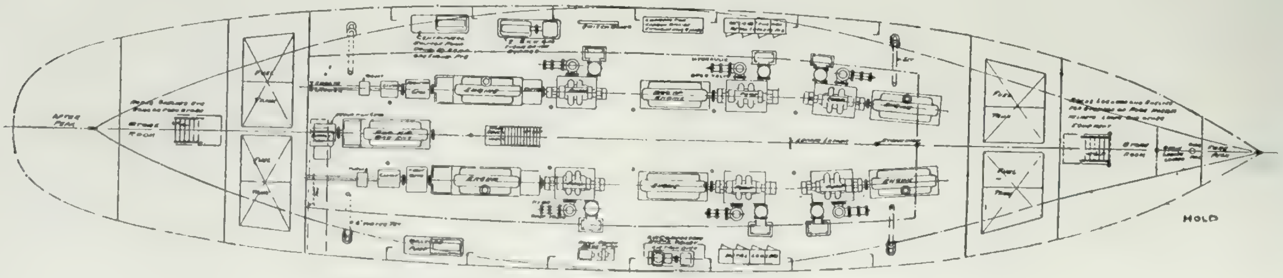
The power plant will consist of seven 6-cylinder, 300-horsepower at 1200 revolutions a minute Winton gasoline engines. One of these engines will be located on the centerline aft and connected through a 3 to 1 reduction gear incorporated in the engine bedplate to the central propellor shaft. Two engines located starboard and port aft also have the 3 to 1 reduction gear incorporated in the after end of their bedplates and are connected through this gear to the outboard propellers. At the forward end, these two engines are each connected through a clutch to a Byron-Jackson 4-stage fire pump. The other four Winton engines are direct connected to Byron-Jackson fire pumps. Each of these pumps has a capacity of 2000 gallons per minute at 200 pounds pressure. This arrangement makes a very flexible power plant giving ample propelling power for a dash to any fire and, with full pump capacity operating, allowing maneuvering power on the central screw.

A forced draft ventilation system is to be employed for keeping a plentiful supply of clean fresh air available for engines and for engine room crew.

The monitor capacity of this boat is unusual. On the dome amidships there are mounted six nozzles, each of 2000-gallons per minute capacity. On the tower there is one 3000-gallon nozzle and on the deck aft another. The large monitor on the pilot house is of 6500-gallons per minute capacity. This total monitor capacity aggregates 24,500 gallons per minute.

In discharging a hydraulic broadside at a fire, the back thrust on the monitor nozzles produces a lateral drift of the hull, which may become a very objectionable feature in the smaller light draft types of fire boat. To offset this, nozzles are fitted along the sides of the hull below the waterline to produce an opposite thrust. On some of the fireboats now in operation the use of these nozzles has greatly reduced the effectiveness of the fire fighting streams through loss of water and of pressure. On the new Seattle fireboat, these nozzles will be regulated by an especially designed hydraulic valve which is calculated to correct all the shortcomings of this method of preventing side drift.

A unique feature of this boat will be the wireless telephone installation in the pilot house which has a phone number in the city directory and which makes

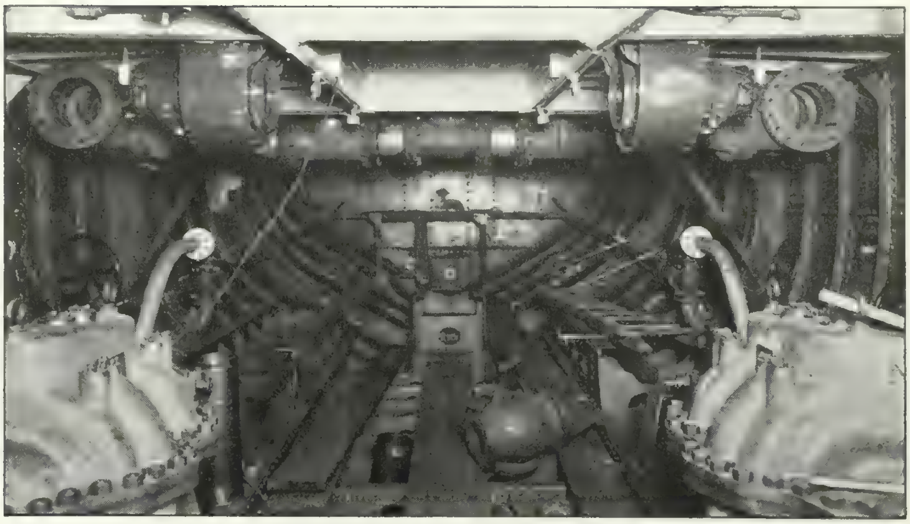


Hold plan showing machinery arrangement of Seattle's new fireboat.

CLOSE QUARTERS

The modern light draft fire fighting craft is a mass of machinery and piping. Our illustration shows the after end of the machinery space of the fireboat L. A. City No. 2 under construction. The seatings for the three Winton gasoline propulsion engines are shown, and the Byron-Jackson 4-stage Multiplex pumps that are driven through clutches from the two outboard engines. Hung from the deck above are two ventilating motors and the fire main headers.

The Byron-Jackson pumps shown here are built entirely of bronze, and are designed especially for this service so as to give the largest possible output with the most compact form of pump.



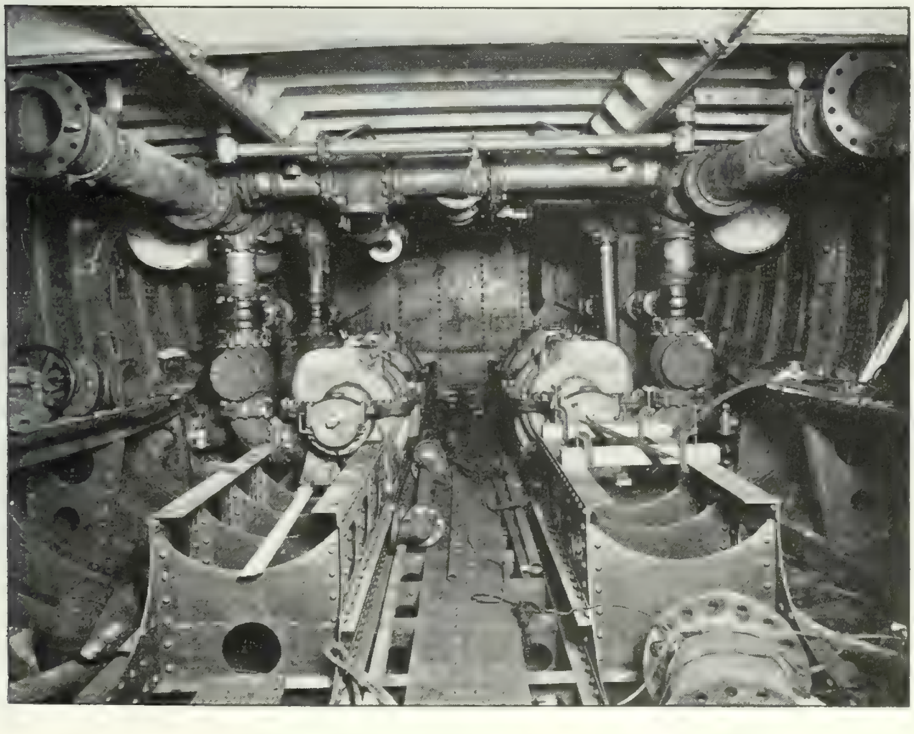
possible the direction of the boat's movements and the fire fighting activities from the shore; so that she can be always in direct connection with the fire chief and cooperate with the shoreside fire fighting force to the fullest extent. This wireless phone will be installed by the Samson Radio Corporation of Seattle.

Auxiliary equipment includes two 1000-gallons per minute Byron-Jackson wrecking pumps driven by modified Fordson gasoline engines. These pumps will be used in salvaging operations. Deck machinery and service pumps will be electrically operated, as will also a 4 x 3½ Ingersoll-Rand Compressor. The electric windlass and the electric boat winch will be built by Allan Cunningham of Seattle, who will build also the hydropneumatic steering gear and the hydraulically operated monitor tower. This tower is of the telescopic type fitted with a hydraulic ram which is capable of lifting the monitor to a level of 40 feet above water line.

Electric current for the lights and for auxiliary power will be supplied by two 15-kilowatt, 110-volt generators driven by Fordson gasoline engines. A shore connection is provided for taking shore power when the boat is tied up at dock.

Fire protection for the boat itself has been very carefully specified. Twenty Lux carbon dioxide cylinders are to be installed with piping arranged so as to make possible the instantaneous smothering of any fire breaking out in any enclosed space on the boat. The manifold on these cylinders also has a connection for hose, and the boat carries 300 feet of flexible metallic hose for fighting fire outside the vessel. Water screen protection is fitted round the pilot house and the rail. Storage of the gasoline fuel is arranged in two tanks forward and two aft. These tanks are electrically welded, vapor-tight, and each pair is in a water-tight and vapor-proof compartment with at least 18 inches clearance all round between the tanks and the enclosure. From these tanks brass rotary pumps electrically operated force the gasoline up to the service tanks in the dome amidships. There are two of these service tanks of 200 gallons capacity each. Feed to all the engines is by gravity.

An Allan Cunningham whistle and a Hendrie and Bolthoff duplex Denver siren will provide adequate navigation and warning signals. Two Carlisle & Finch searchlights will be fitted.



THE PUMP ROOM

The picture from which this illustration is taken was made by turning the camera around on the same spot from which the view at the top of the page was made. The two views include the whole length of the machinery space of fireboat L. A. City No. 2. This lower view shows four Byron-Jackson 4-stage Multiplex fire pumps and the seatings for the four engines for driving these pumps, together with the pipe connections and main headers.

The Byron-Jackson Pump Manufacturing Co. undertook to design this very compact, all bronze, centrifugal pump to meet a specification requiring a delivery of 1700 gallons per minute against 200 pounds per square inch pressure for each pump.

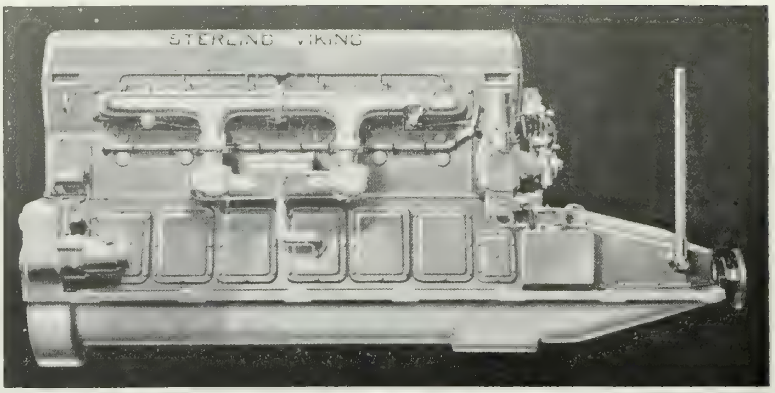
During the underwriters' fire test as illustrated on the frontispiece of this issue of Pacific Marine Review, each of the six pumps actually delivered 1900 gallons per minute at 200 pounds pressure.

New Fireboats for Portland

PORTLAND, Oregon, is the third major harbor on the Pacific Coast to provide efficient, modern fire fighting equipment for the protection of its waterfront. Following the lead of Los Angeles and Seattle, Portland has decided to build three light draft, speedy, gasoline engine driven fireboats, which will be ready on instant notice to fight any waterfront fire.

The problem of design for the Portland boats was considerably different from that of either Seattle or Los Angeles. A much shallower draft was required, the conditions calling for ability to navigate in water which in some locations is not more than 7 or 8 feet deep. Under the supervision of Lee G. Holden, chief engineer of the Portland Fire Department, A. D. Merrill, naval architect of Portland, was commissioned to make a design that would meet these conditions.

Mr. Merrill's first design was for a boat 65 feet long, with triple screws. Model tank experiments, however, showed that the triple screw in the shallow draft model was inefficient. The model was then lengthened for a better block coefficient and twin screw propulsion adopted. The boats, as now proposed, will be 85 feet 11 inches long, 5 feet 6 inches draft. The extreme height of the superstructure above waterline is 12 feet 6 inches, so that these boats can pass under any of the Portland bridges without waiting for draws to open.



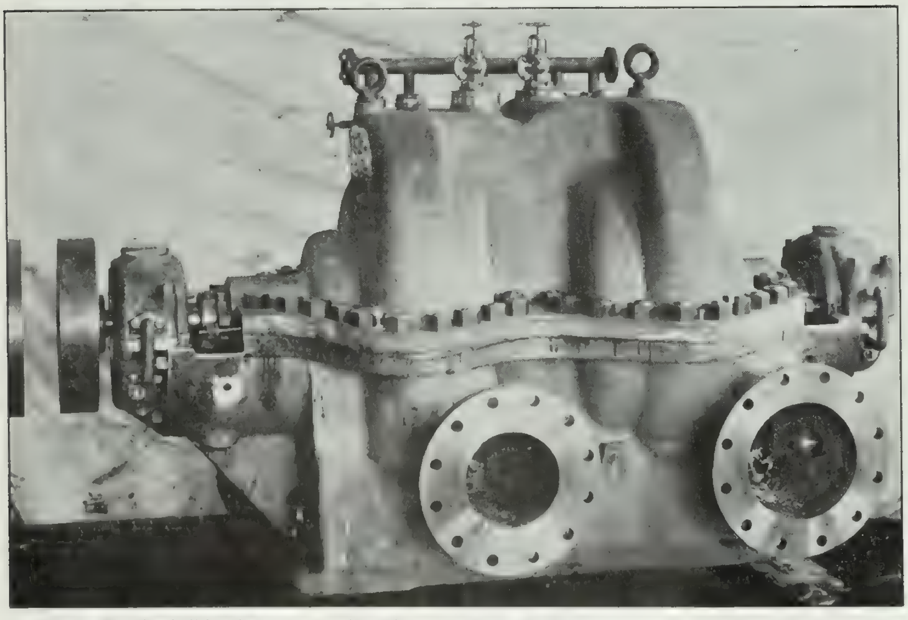
6-cylinder Sterling Viking type marine engine. Two of these engines and two 8-cylinder engines of the same type will be used in each of the new fireboats for the Port of Portland.

The award for machinery for these three boats has been given to the Sterling Engine Company, through King-Knight Co., San Francisco, and to the Byron-Jackson Pump Manufacturing Co. of Berkeley, California.

The power plant consists of two 8-cylinder 8 by 9 special Viking type Sterling gasoline engines, each developing 565 horsepower at 1200 revolutions a minute, and two 6-cylinder 8 by 9 special Viking type Sterling gasoline engines, each developing 425 horsepower at 1200 revolutions a minute. The two 8-cylinder engines are direct connected at their after ends through clutches to propeller shafts and at the forward ends through clutches to Byron-Jackson 4-stage 8-inch ball bearing mounted Multiplex pumps of the type especially designed by the engineers of the Byron-Jackson Manufacturing Co. for fireboat use. Each of these pumps will deliver 2800 gallons per minute against 200 pounds pressure. The two 6-cylinder engines are direct-connected to Byron-Jackson pumps of the same type as described above and have a capacity of 2100 gallons per minute each against a head of 200 pounds.

The engines are all of the Viking type, modified especially for this job. The principal modification is in moving the cam shaft from the top of the cylinders to the base of the engine in order to gain head room. Push rods and rocker arms transmit the cam motion to the valves in the cylinder heads.

Sterling gas engines in the Seagull, Coast Guard, and Viking marine types all feature removable cylinder liners similar to the best diesel practice. All crank shafts are carefully counterbalanced and all bearings, including wrist pin, are full force feed lubricated. Electric starters are part of the equipment. These medium speed, high duty engines are proving themselves to be sturdy, dependable, compact power plants on many commercial and pleasure craft.



A 4-stage, 8-inch, ball-bearing mounts, Multiflex centrifugal fireboat pump as designed and built by the Byron Jackson Manufacturing Co. Four of these pumps are to be used in each of the new fireboats for the Port of Portland.

The Byron-Jackson pumps which are to be used on the Portland fireboats are to be of cast iron, bronze fitted. As mentioned above, they are especially designed for fireboat use and it is a very high compliment to the organization of the Byron-Jackson Pump Manufacturing Co. that these pumps are being used in fireboats for three different ports located in three separate states and designed and built under the supervision of three different naval architects. However, this is not so much a matter of surprise when we take into consideration the facts that the leading centrifugal pump specialists in the United States are in the organization of the Byron-Jackson Pump Mfg. Co. and that these specialists produced the design of these pumps to meet fireboat specifications. It is a matter of statistics that the Byron-Jackson organization is the largest exclusive manufacturer of centrifugal pumps in the United States, if not in the world.

With the exception of the impellers, all of the pump parts embodied in the various fire pumps for the three boats are mechanically interchangeable. The Portland fireboats will be equipped with a monitor tower amidships having a full sweep fore and aft and all around the boat. Monitor equipment from the present fireboats will be used to a large extent.

It is intended on the Portland boats to install remote control of engines and pumps from the pilot house instead of the customary engine room telegraph signals for engine drive control as installed on the Seattle and Los Angeles boats. It is felt that having the control of the movements of the boat and of the manipulation of the fire fighting streams directly in the hands of the navigator in the pilothouse is a very much safer proposition than to have the additional personal element involved of controlling indirectly through the ordinary engine telegraph signals.

Portland is to be congratulated in deciding upon changing from the old steam driven fireboats to the more modern internal combustion engine drive. The latter is not only more instantly ready to proceed to a fire to save the taxpayers' property, but also is continually preventing the drain upon the taxpayers' pocket caused through the standby losses incident to keeping the fire up under steam boilers. There is as much reason for making this substitution as there was for making the substitution from horses to trucks.

Stainless Steel Propellers

THE steamer Avalon, operated by the Wilmington Transportation Company between Los Angeles harbor and Catalina Island, has been thoroughly reconditioned at the plant of the Los Angeles Shipbuilding & Drydock Corporation under the supervision of A. Young & Sons. Her lower guards, not needed in her present service, have been removed and replaced with belt plating, giving her a much more graceful appearance. All interiors have been redecorated and the engines and boilers overhauled, putting the entire ship in first class order.

Stainless steel propellers, made by the Warman Steel Casting Company of Los Angeles will replace her old ones. These propellers were designed by William Lambie of Wilmington. They are of the 3-blade, built type, of 11 feet 8 inches diameter and 15 feet pitch. On her trials after the overhauling, these newly installed propellers increased her speed by a little more than half a knot, while a most marked absence of vibration was noted. Lambie seems to achieve this in every instance where his propellers are tried out.

A New Welding Rod

A NEW line of high grade "dipped" welding rod is now obtainable from the Lincoln Electric Company of Cleveland. This "dipped" steel rod is the result of several years study in the company's research laboratories and will be known as Stable-Arc welding rod and is a companion to the Kathode welding rod which has been sold by the same company for many years and is now universally known to the welding trade.

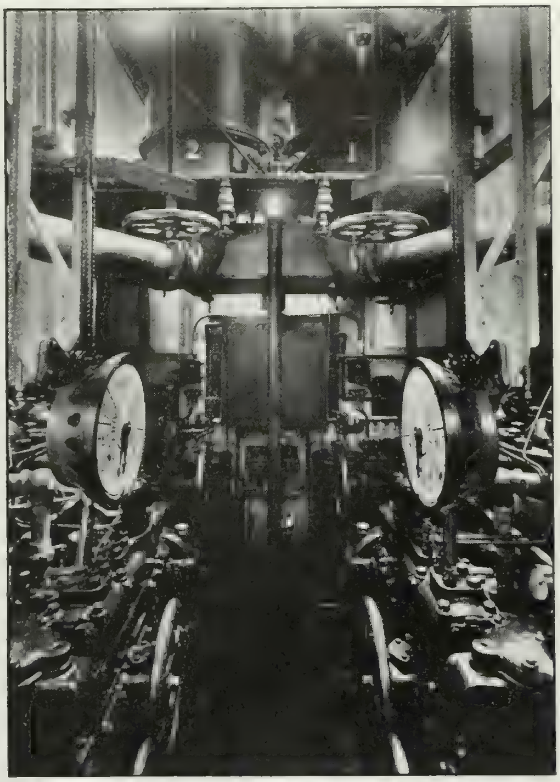
With this new rod it is possible to go to considerably larger diameters than has been customary in welding rods for metal electrode welding and is being carried in all sizes up to ½-inch.

It is claimed that this rod permits of much higher currents than has been used heretofore with the resulting greater speed. As labor is by far the greatest factor in welding costs, increased speed means a substantial decrease in welding cost. Not only does the greater heat give greater speed and less cost but also better penetration and a much smoother finished bead. In addition the greater heat obtainable by the higher currents results in an annealing action which increases the ductility of the weld and gives a greater elongation. Current densities of 15,000 amperes and more per square inch can be used.

Stable-Arc welding rod is obtainable in standard 50-pound bundles wrapped in burlap and in lengths of 14 inches. It can also be secured in longer lengths if desired.

Artist's conception of the new motor liners, three of which are now building in Japanese shipyards for transpacific service.

Auxiliary Schooner Yacht Northern Light

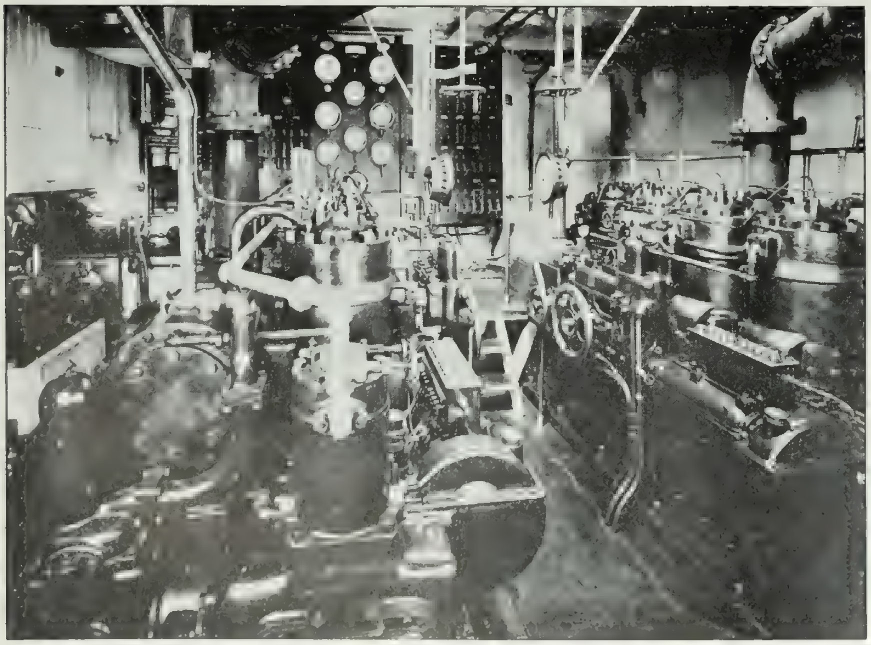


The two views on this page illustrate the complete power plant installed by Fairbanks, Morse & Co. for the propulsion, lighting, and operation of the Northern Light. Practically every item in the equipment of this engine room is supplied by Fairbanks-Morse.

THE auxiliary schooner yacht Northern Light, built at the Oakland yard of W. F. Stone & Son for John Borden of Chicago, has been delivered and is now on a cruise to Alaskan and Arctic waters. This vessel is a very beautiful example of the wooden shipbuilder's art. She is the largest of her type ever turned out in a Pacific Coast yard. Her principal characteristics are:

Length over-all	140′ 0″
Length, water line	106′ 8″
Beam	30′ 0″
Draft loaded	15′ 0″
Displacement, tons	312

The yacht was built from designs by Henry C. Grebe & Co., Inc., naval architects and marine engineers of Chicago, and is designed especially for Arctic navigation, the hull being so molded as to lift clear when pinched by ice. For the same reason the Northern Light is of exceptionally heavy construction, largely in excess of the requirements of all classification societies. As will be noted from the construction pictures reproduced herewith, her frames and planking are very massive. All frames are double, 12 in. molded and spaced 24 in. centers. The planking is 4-inch fir and the ceiling 3-inch fir, the bilge strakes being 3½-inch. Sheathing of iron bark is fitted as an additional protection from ice, and in the forepeak the framing is fitted solid to a point well above the water line.



The engine room equipment of the Northern Light was furnished by Fairbanks, Morse & Company. The main propelling engines are two 120-horsepower Fairbanks-Morse full reversible, marine type, equipped with clutches for releasing the propeller shafts when the vessel is navigating under sail. Two Fairbanks-Morse direct current generators, one 20 kilowatt and one 5 kilowatt, are operated from the main engines for power for auxiliary machinery and for lighting. For stand-by purposes and for use when the vessel is under sail only, there is provided a 7½ horsepower Fairbanks-Morse CO engine directly connected to a 4½ kilowatt Fairbanks-Morse direct current generator. The auxiliary air compressor, ice machine, bilge pump, fire pump, and all engine room auxiliaries are driven by Fairbanks-Morse direct current motors. The power developed by the two main engines is figured to give the Northern Light a speed of 10 miles per hour. The propellers are designed especially with the idea of bucking the boat through northern ice.

With a good free breeze, the Northern Light should show a good turn of speed as a sailing yacht. She spreads 7563 square feet of canvas and is equipped with masts and spars and standing rigging of sufficient strength to stand up under sail in almost any weather.

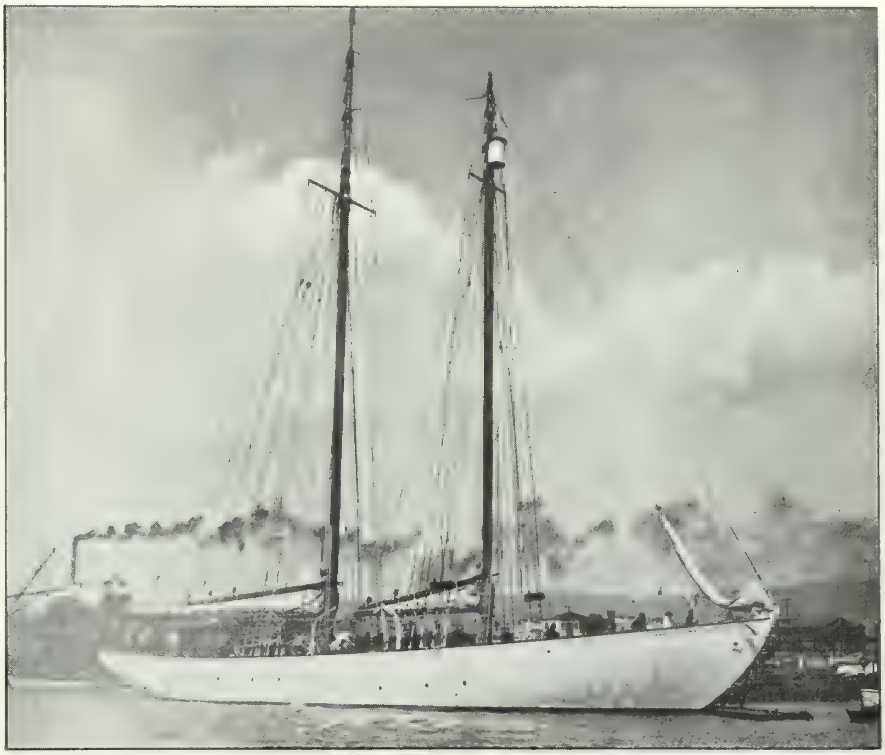
The Waterbury Company supplied the running and standing rigging, the installation having been made by the Haviside Company of San Francisco. Her suit of sail was supplied by Wilson and Slisby of Boston.

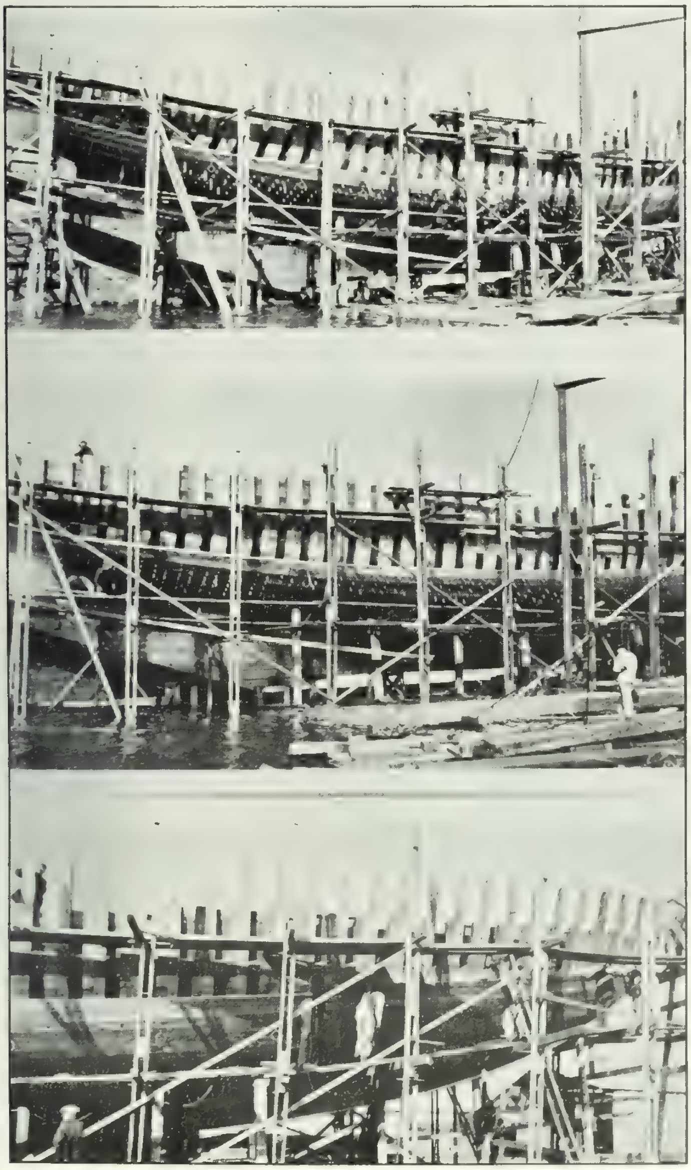
Deck auxiliaries for the Northern Light were supplied by Allan Cunningham of Seattle. They consist of a self-contained type Cunningham anchor windlass, driven by General Electric water-tight motors, and a self-contained sail and boat hoist of the well known Cunningham type, also driven by a General Electric motor. The steering gear is of the right and left hand screw type, designed especially for this vessel by Cunningham and fitted with a 48-inch teakwood wheel.

The Lux system of fire protection is used. A battery of six Lux cylinders gives protection to the engine room and the tank and bilge spaces. This equipment was supplied by Walter Kidde & Company through Hough & Egbert of San Francisco.

Fuel oil tanks of 8000 gallons capacity and fresh water tanks with capacity in excess of 3000 gallons give the Northern Light a large cruising radius. These tanks were supplied by the Main Iron Works of San Francisco.

Other firms participating in the equipment of the Northern Light include: plumbing, Lee electric toilets and Crane Co. fixtures; heating, the Arcola hot water system by the American Radiator Co.; anchors, the Isaacson Iron Works of Seattle through Albert Lawson of San Francisco; furnishings, drapes, and floor coverings, W. & J. Sloane, San Francisco; galley equipment, West, Elliott & Gordon and W. S. Ray Manufacturing Co.; paint, the Baltimore copper paint by W. P.

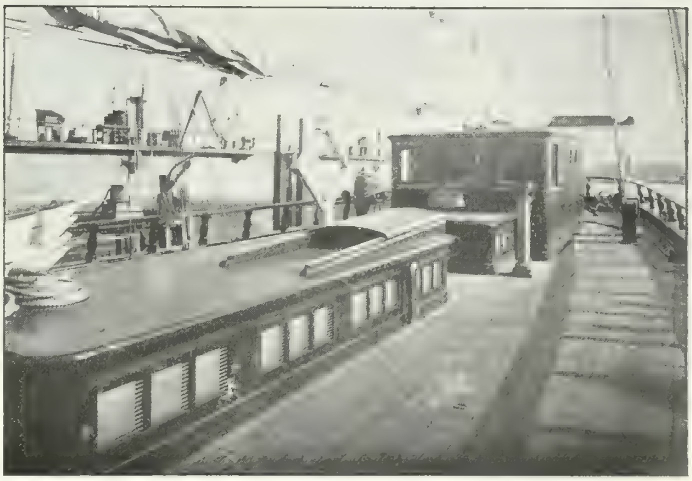


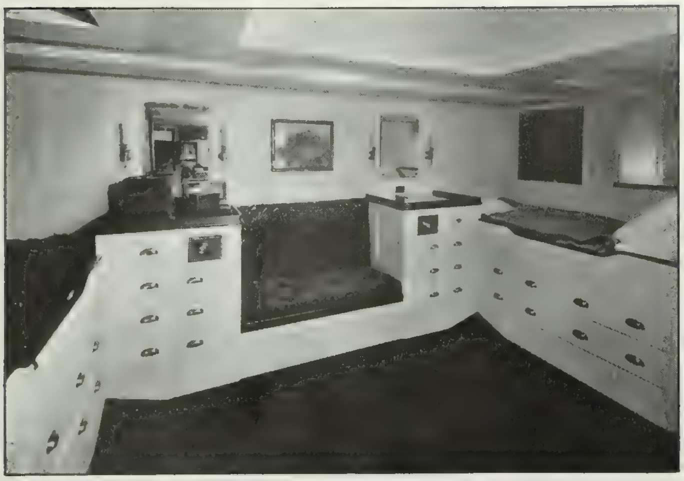


The Northern Light is a splendid example of the art of the ship carpenter. At the left are shown three views of the yacht under construction, featuring the liberal use of trenails for plank fastenings.

Above, the schooner is shown under bare poles lying at the wharf in her builder's yard, together with a very good view of her deck forward.

Below is shown a sweep of the quarter deck aft. This vessel is put together with hard service in view. Seaworthiness under Arctic conditions is the main objective of the designer, builder, and owner.





In her finish and furnishings below deck, as well as above, everything aboard the Northern Light is worked out shipshape and Bristol fashion. At the left is shown a typical interior, the owner's stateroom. Every bit of space is utilized, and the interiors of the cabins are reminiscent of old sailing ship days. While retaining all of those features dear to the lover of sea life, no modern improvement for communication or navigation has been neglected. Note the built-in radio.

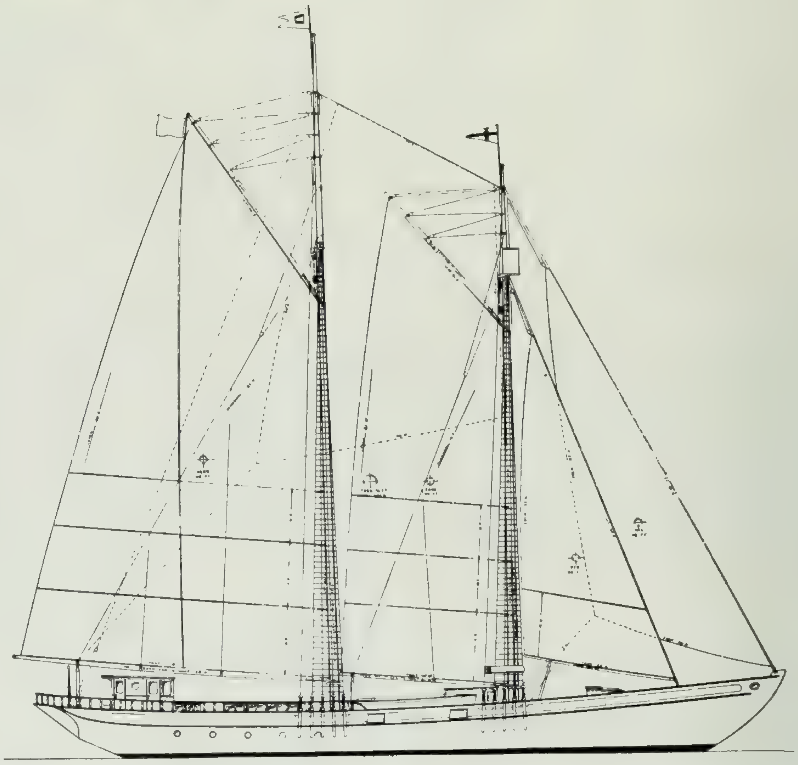
Below is shown the outboard elevation of the Northern Light with all plain sails set. She carries 7563 square feet of canvas, and as her twin screws are equipped with clutches, enabling them to idle when the ship is propelled by sails alone, she should show a good turn of speed with a fair wind.

Fuller & Co.; engine room telegraphs by Chas. Cory & Son.

White Brothers of San Francisco supplied the hardwood which was liberally used in construction and trim. Ship timber was supplied by the E. K. Wood Lumber Co. of San Francisco; oakum by Ford Barstow; anchor chains by the Seattle Chain Company; McNab Dial-O-Meters were supplied by C. V. Lane of San Francisco.

E. F. Tway was responsible for the ship smith work, and Kelvin and White supplied the navigation instruments.

The Northern Light was especially built for exploration cruises. Her crew is largely composed of Sea Scouts personally chosen by her owner to accompany him on this cruise. Mr. Borden is commander of his own yacht. He holds the title of Lieutenant-Commander in the United States Navy and saw considerable service during the late war in the submarine zone as a commander of the naval auxiliary steam yacht Kanawha.



Honolulu, the crossroads of the Pacific, was much in the public eye last month as hostess to the Pan-Pacific Conference. Our illustration shows the passenger liner Matsonia of the Matson Navigation Company coming up to her pier at Honolulu harbor.

Pacific Workboats and Their Power Plants

Southern California Workboat Notes

The seagoing fishing boat Lusitania, a 98-footer, powered with a 300-horsepower Western-Enterprise diesel engine. The boat was built at Al Larson's yard, San Pedro, for San Diego order.

William Muller, boat builder at Wilmington has just turned out a new towboat for the Wilmington Transportation Co. This latest addition to the fleet is 85 feet length, 14 feet 6 inches beam, and 11 feet depth. She is fitted with a Winton diesel of 400 horsepower and with all the regular gear of a boat of her class. When launched she was christened the Louie Black in honor of Captain Black who has served the company (formerly the Banning Company) for over twenty-four years. The new boat will be both speedy and powerful.

Muller has also launched a heavy rock barge of his design for the Wilmington Transportation Co. and will build another at once. These heavy barges are used to carry rock from Catalina Island to the mainland, and are towed by the big towboats. The barges are 120 feet length, 38 feet beam, and 10 feet depth. They carry a load of 750 tons of rock on deck, but are practically unsinkable, being very rigidly built. Besides the sides, there are four longitudinal bulkheads of 6-inch Oregon pine, which, with heavy knees, beams, and decks, together with transverse bulkheads, make a strong hull for the wearing work of rock freighting. Besides the stress and strain of the cargo these barges at times encounter heavy weather and must be staunch to stand the battering when towed by powerful tugs.

The first glass bottomed boat ever built on the Pacific was the Cleopatra. She has been in service at Catalina for the past 27 years, and many thousands of tourists have gazed at marine wonders through the observation glasses of her bottom. She is still in good condition, having been recently thoroughly refitted at Muller's yard, and she will be in service the coming season with five more similar vessels.

At Al Larsen's Yard, East San Pedro, the Huntress, a former subchaser, has been hauled out for painting, etc. The Huntress is now operated by the Hatfield Packing Company, who have practically rebuilt her, a new Atlas-Imperial diesel engine replacing her former power. The packing company will use her as a tender for a fish cannery in Lower California waters.

The 98-foot heavy seagoing fishing workboat Lusitania, built at Al Larson's yard for San Diego parties, is proving herself a very able craft. Her 300-horsepower Western-Enterprise diesel gives her a 12-knot speed, and as a sea boat she is all that any fisherman could wish.

The repair ways at Al Larson's yard are kept busy on repair work, and two new fishing boat hulls are coming into shape in the sheds.

The Harbor Boat and Machine Works, East San Pedro, are busy on repair and new work. Three fishing craft for Japanese interests have recently been launched, and a cruiser yacht is now being laid down.

Harry Carlson Boat and Yacht Company is now the firm name of the old Seacraft Corporation of Wilmington. New owners have acquired the yard, and under the able management of H. Carlson a strong bid for business will be made. Mr. Carlson is a master workboat builder and is also an able designer and builder of pleasure craft.

He is just now building a very fine seagoing yacht for Lee Phillips of Los Angeles, president of the Pacific Mutual Life Insurance Co. This craft is 96 feet length, 20 feet beam, and 6 feet draft. She will be propelled by a 200-horsepower Atlas-Imperial diesel engine. The latest equipment in auxiliaries will be installed. The fuel tanks are figured for a 3000 mile cruising radius.

The firm of Ets-Hokin & Galvan have supplied her electrical gear, which includes a 12½-kilowatt Universal auxiliary generator and a bank of 96 Edison alkaline storage batteries, which will deliver 225 ampere-hours at 120 volts. A 7½-kilowatt generator is driven by silent chain from the main engine. With these three units electrical current for lighting and all purposes will be plentiful. A special Delco fresh water, hot and cold system is installed, and an A. M. F. salt water sanitary system with extra large sump tank for use in harbor, which is discharged by a special Rumsey electrically driven pump.

Fellows & Stewart of San Pedro are as usual busy building speed boats and water taxis. Besides these, small yachts and other craft, with repairs, keep a staff of some forty mechanics busy. It seems that the saturation point for small craft is still far in the future, judging from the many boats ordered and built.

Delano Brusstar, elder son of a family of well known boat and shipbuilders, has started a yard at Wilmington and reports good business. He will specialize on yachts and workboats with repairs of all classes of vessels. A 78-foot yacht for W. H. Smith of Los Angeles has just been finished at Brusstar's yard. She has twin screws, driven by 70 - horsepower Mianus diesel engine and develops good speed. Doheny's yacht Casiana is being overhauled at the same yard, and a new tender is being built for her.

A. R. Robbins Marine Engine Works at San Diego are as usual very busy on repairs and building of workboats. The deepsea fishing vessel Milwaukee is the latest output and is a fine sample of the work done at this yard. She is 78 feet length with a beam of 20 feet and 9 feet depth. An Atlas-Imperial diesel of the 4-cylinder type and developing 125 horsepower will give her a good 11 knots speed at sea. Her owner, Captain Laurencio San Felipo will use his new boat in the Mexican Coast tuna fishing trade.

The Robbins Machine Works have delivered since the first of the year 10 sets of the small diesels specially made by them for fishing vessels of light draft. The favorite seems to be the 2-cylinder 20-horsepower, though there are now inquiries in for a couple of the 4-cylinder 40-horsepower type. The ways and shop are doing a good share of the business of the fishing fleet, and the outlook for increased work is favorable.

Campbell Machine Co. of San Diego builders of the Olympia, whose 225-horsepower Union diesel engine sends her along a good 12 knots, will have ready for service in June an 88-foot by 22-foot beam and 7-foot draft fishing workboat for Captain Manuel Frietas. She will be fitted with a Union 225-horsepower diesel and will make good sea speed.

The same firm is building a 32-foot fishing craft which will have a Hicks 20-horsepower gas engine. They have also sold three Bolinders recently, these being preferred by some owners. A 12-horsepower Bolinder is used as an auxiliary in the Olympia and gives every satisfaction.

Campbell's new yard on the "Belt" foot of Eighth street, San Diego, will soon be in full operation. There will be three sets of ways, each able to handle two vessels at once. A minimum depth of water of 10 feet alongside gives ample draft for small craft and vessels up to 125 tons can be handled easily. A new steel shop and machine shop are being built, and the old shop will be used as a boat building shed. Their Plant No. 2, at the northern end of the harbor, is used only for building and repairing hulls. It has four marine ways and can haul out eight boats at a time. In addition there is ample room for launching ways. Business is reported very good by the heads of the firm.

The Star & Crescent Co., San Diego, have not of late been doing much outside work, as their own big fleet keeps them fairly busy on renewals and repairs.

George Beermaker is operating the workboat Presidente between San Diego and Ensenada. His larger boat, Gryme, has been chartered to carry material to San Jose del Cabo for a big tuna cannery. She brings back tomatoes on return trips.

A Master Mariner Model Maker

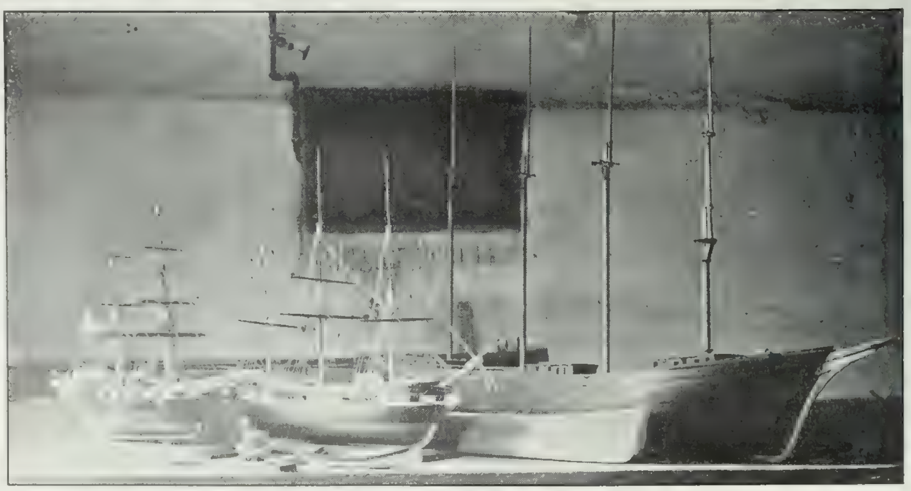
CAPTAIN Phineas Banning Blanchard was born at sea off Catalina Island some sixty years ago. He is a true son of Neptune, as he came aboard the vessel of which his father was captain, his mother making the voyage with her husband at the time. The young mariner and his mother were for a time after the event guests of the late General P. Banning, owner of the ship. Reaching manhood young Blanchard naturally took up sea life, following it for years. He commanded many vessels, notably the Bangalore, in which he made several voyages from the Atlantic to the Pacific Coasts. He later became interested in an offer of the Bannings, and left his command, the Bangalore, in New York, coming overland to take charge of the Banning steamer Cabrillo. Strange to say, the Bangalore left New York with her new captain and was never heard of afterwards.

Captain Blanchard served on this coast for many years and when he retired a while back, made his home in Brooklyn, N.Y., where he devotes himself to the work of ship model building. The photo herewith shows a few of the craft he has built, and they are true copies of the originals in every detail.

HONORED FOR LONG SERVICE

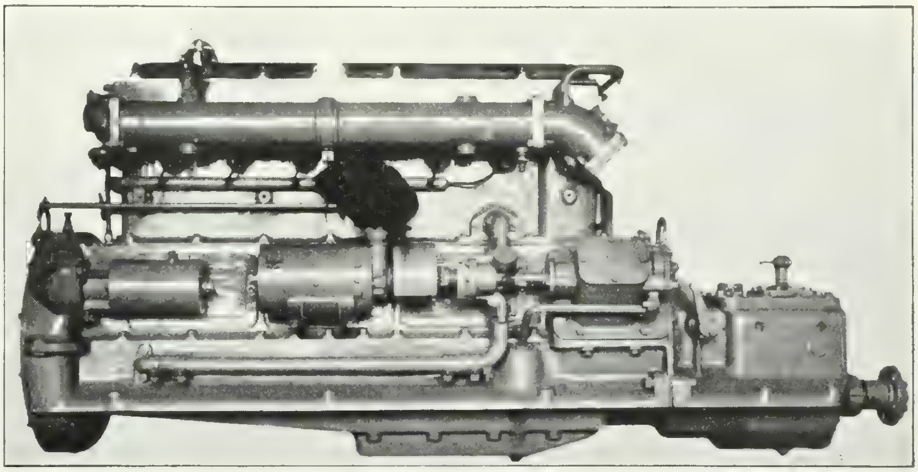
CAPTAIN Louie Black is perhaps one of the best known men in the work boat and towing business in southern California. He came to the Pacific Coast some forty-odd years ago, did otter and seal hunting in Alaska for a time, and was also engaged in the coasting trade. Twenty-four years ago he began to work for the Banning Company at San Pedro, and when this was taken over by the Wrigley interests, Captain Louie Black was retained.

A few weeks ago one of the finest of the firm's boats of the tug class was launched and christened Louie Black in recognition of the many years of service by him. His many friends along the coast heartily congratulate Captain Louie on this honor.



A few of the various types of models built by Captain Phineas Banning Blanchard.

The Hall-Scott 175



Exhaust side of H.S.R. Type Model 175 gasoline engine with built-in water-cooled reduction gear.

THE latest model at the plant of the Hall Scott Motor Car Company of Berkeley, California, is the H.S.R. type Model 175. Hall-Scott type R engines have had a remarkable success. This type combines the perfected Hall-Scott medium duty gasoline engine with the new Hall-Scott water-cooled reduction gear and the combination makes an ideal plant for power boats where light weight combined with large power is essential. The Model 175 gives an engine of this type having a conservative rating of 175 horsepower at 1800 revolutions per minute of the crank shaft.

This engine and gear are exceedingly smooth and quiet in their operation. All moving parts are enclosed. The lower crank case and the gear box are thoroughly water-cooled. At full speed the built-in pump has an actual capacity of 40 gallons per hour against an 8-foot lift. This capacity insures an ample supply at idling speeds.

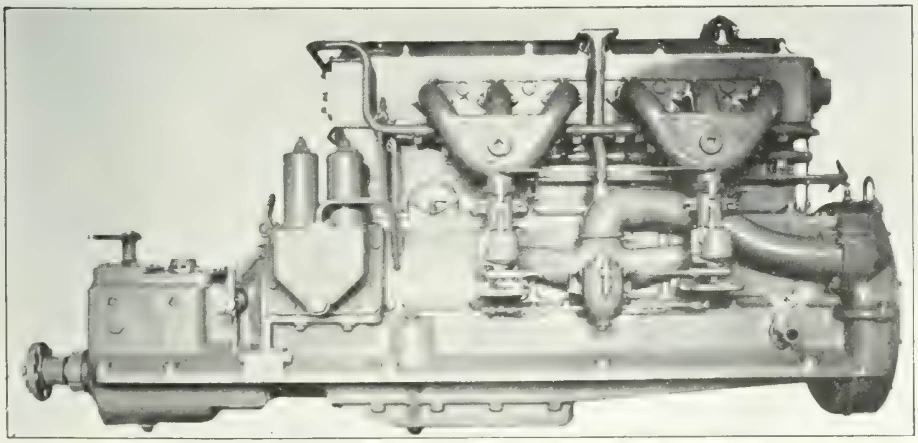
Reduction gear is furnished in either 3 to 1 or 2 to 1 ratio, or if desired for high speed cruisers, the engine may be furnished for direct connection. A built-in Hall-Scott designed propeller shaft brake is synchronized with the clutch throwout so that all clashing of gears is eliminated.

As will be noted in the illustration showing the intake side of this engine, the carburetors take their air supply from the casing surrounding the flywheel. This arrangement in conjunction with the design of the intake manifold produces the effect of a semisupercharger and at the same time eliminates all fire hazard caused by backfiring from the engine. A vapor-tight cover is fitted over the rocker arm on top of the cylinders and this cover is connected by pipe to the air intake manifold thus drawing all oil fumes into the carburetors for consumption in the cylinders.

The engine has six cylinders of 5 inches diameter, and 7 inches stroke, or a piston displacement of 824.67 cubic inches. The fuel consumption is 0.06 pound per brake horsepower hour. The weight is approximately 2650 pounds including gear box. A 400-watt, 12-volt generator driven off the pump shaft gives ample electric power for the ignition system, the running lights, and the storage battery. A starting motor of ample capacity is built in for geared connection to fly wheel. Double ignition is fitted, firing two plugs in each cylinder.

The over-all installation dimensions of the H.S.R. 175 are: length, including gear box and propeller shaft coupling, 7 feet 9-3/16 inches; greatest height above center line of propeller shaft 35-5/8 inches; width over control handles, 39½ inches. A very compact sturdy and dependable power unit for workboat or pleasure craft use.

The Hall Scott Motor Car Company have opened a factory branch to supply the southern California field at 240 Avalon Boulevard, Wilmington. Here they show several sets of the later types of their engines for workboats, including the Model 175 described above. A 35-kilowatt auxiliary electric plant, coupled to a 50-horsepower engine is part of the display. A full line is carried in stock.



Intake side of Hall-Scott Type R Model 175 marine gasoline engine.

Veneer Panels

VENEER panels are being used for marine work to a much greater extent than formerly. The California Panel and Veneer Company report several large orders for this type of panel, which, owing to lightness and absolute freedom from warp, is desirable. Hardwoods for construction of these products are obtained from all sections of the United States. Fir and spruce come from the northwest; walnut and figured gum from the middle west. Mahogany and other tropical woods come mostly from the Phillipines. The firm makes a specialty of panels and nothing else, and naturally the output is of the highest class.

Howell Baker, president and general manager for the past twelve years is very optimistic of the future, predicting a big demand for panels not only for steamers and yachts but for residences of the more elaborate sort. These goods can be economically used in every class of building.

Auxiliaries-Ship Supplies-Marine Equipment

New Westinghouse Geared Turbines

TURBINE units of the geared turbine type in ratings from 75 kilowatts to 500 kilowatts have been placed on the market by the Westinghouse Electric and Manufacturing Company. These turbines, although primarily intended for driving either alternating or direct current generators, may be used to drive practically any apparatus operating at speeds within the range for which the gears are suited. Turbine generator units of these capacities find their principal application as steam driven exciter sets for central stations or as sources of power in industrial and marine plants.

Compact but accessible, these units are built to withstand the hardest service with a minimum of operating attention. Their steam consumption rate is excellent. A distinctive and exclusive feature is the oil operated governor, which is similar to that used on larger Westinghouse turbines. The oil governor provides excellent control and regulation and makes it possible for the operator to vary the speed over a wide range while the turbine is in operation.

Space requirements have been decreased by incorporating the turbine and gear in a single casing. The turbine rotor, the blading of which is of the single row re-entry type, is overhung on the end of the pinion shaft. This arrangement simplifies the design by eliminating all the turbine bearings and one of the glands as well as the coupling between the turbine and pinion. The turbine when used with a generator is so designed that the unit may be mounted directly on the foundation, thus eliminating the heavy cast iron bedplate usually required.

The steam chest is mounted directly on the foundation at the side of the turbine. This protects the turbine casing from having strains imposed upon it by the steam piping.

Another exclusive feature is the restraining ring. This device gives the operator the assurance of personal safety in case of accidental extreme overspeeding because it positively prevents bursting of the turbine casing. This is a safety feature, which is provided in addition to the standard overspeed safety governor.

The reduction gear is of the latest, double helical design, giving constant and equal tooth surface contact between the gear and pinion.

This turbine was exhibited at the recent power show held in New York and elicited much favorable comment by its neat and compact appearance, its rugged construction and the fact that the turbine and gear were self contained.

Contra-Propeller Economy

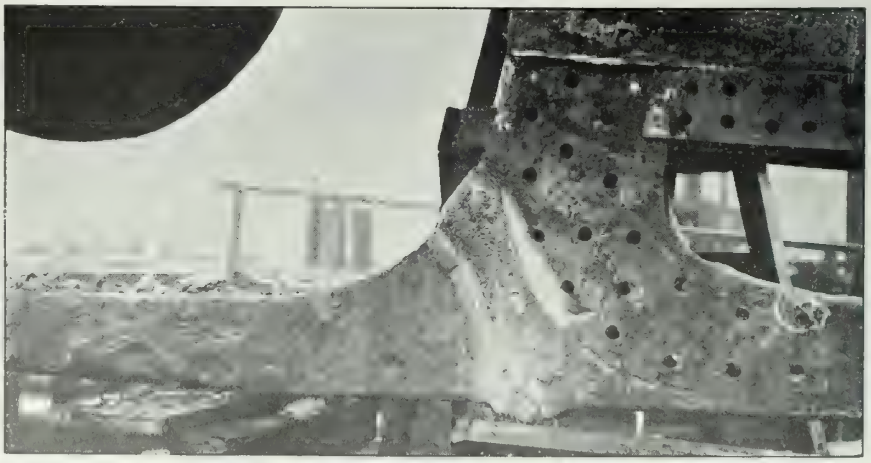
REMARKABLE results have been achieved by the Lloyd Sabaudo through fitting Star contra-propellers on their liner Conte Rosso. This vessel, of 17,084 tons, completed in March her first round voyage between Genoa and New York, with the fitting installed, and authoritative advices state that her speed has been increased by about half a knot, although extremely heavy weather was experienced for two whole days on the return voyage. Between Gibraltar, Naples, and Genoa the Conte Rosso steamed at 19.10 knots on the same fuel consumption and the same number of revolutions as during all her previous voyages in the past five years; whereas her average speed for that part of her voyage had previously been 18½ knots. As a result of this showing, Lloyd Sabaudo have decided to fit Star contra-propellers to the Conte Werde and Conte Biancamano and also to build them into the new Conte Grande, now under construcstruction at Monfalcone and expected to be ready for delivery about April 1 of next year.

The fact that the inboard guide vanes alone resulted in an increase in speed of one-half knot on one of the large "greyhounds" should be conclusive proof that the contra-propeller on twin screw ships is not only justified, but necessary.

Route Pilot for New Chesapeake and Delaware Canal. Detailed information concerning the new Chesapeake and Delaware Canal will be given in a forthcoming supplement to the 1927 edition of the U. S. Coast and Geodetic Survey's Inside Route Pilot.

The new canal, opened to navigation on March 1, provides an inland waterway 12 miles long, without locks, from the Delaware River to Chesapeake Bay. It is a part of the inside water route charted by the Coast and Geodetic Survey from New York to Miami, and thence to New Orleans,

Regulations for the canal, which is owned and maintained by the United States Government, have been prescribed by the Secretary of War and are contained in full in the new supplement of the Coast and Geodetic Survey.



A completed thermit weld on the stern post of the West Keene. This repair was recently effected in record time at a New York plant of the Todd Shipyards Corporation.

Loading off the Wire

FOR many years the coasts of northern California and of Oregon have been noted for the daring of lumber operators, who at many points along these rocky shores load their cargoes of lumber under the wire or chute; that is, the vessel, anchored or buoyed as close in to the line of breakers as possible, has lumber passed down to her from the rocks over a cableway or along a chute.

One of the most famous of these outports is Rockport, Mendocino County, California. Here there was an outlying rock of sufficient area to place shore-end machinery for a ship-loading cable and to spot considerable lumber. This rock was joined to the mainland cliff by a suspension bridge, from the shore end of which a road, partly supported by trestle work, led to a suitable approach from the mill. In the old days of low labor cost and cheap lumber the large annual maintenance work on this structure was not noticed. But as labor costs mounted and timber became less easily accessible, the port was less used, the bridge and its approaches were left in disrepair, and finally the bridge was washed out.

Recently the demand for timber sources has led fresh capital to Rockport, and the famous old outport of Mendocino County has come under the control of the Finkbine-Guild lumber interests of the Mississippi valley. On investigation by engineers representing these interests, it was determined that the most economical method of transporting lumber from the cliff to the rock was by means of a cableway. This was arranged, as shown in the illustrations, by building two towers of redwood to take the inshore and outshore ends of cable and the installation of a Lidgerwood cable way system, which handles a 10-ton load of lumber at 1500 feet per minute speed.

The inshore tower houses the hoisting engine, which is the standard Lidgerwood steam cableway engine, with its control levers arranged for manipulation by the operator from a stage located at sufficient height on the tower so that he can overlook all loading operations. The engine has 12 by 12-inch double cylinders controlled by reversible link motion. There are two drums of exactly the same diameter, one for the hoisting rope and one for the endless rope controlling the travel of the carriage. These drums can be used independently or together. The load can be raised or lowered while traveling or conveyed at a uniform height. The 10-ton loads at Rockport are carried as double units, the 5-ton sling unit being the load handled over the ship's wire. The wire cables used in this installation were supplied by the San Francisco branch of A. Leschen and Sons of St. Louis.

The tower at the inshore end of the Rockport cableway. Tower is built of redwood.

Cableways of this character, carrying heavy loads at high speeds, need efficient lubrication. This is provided by a special lubricant made to specifications for the Lidgerwood Manufacturing Company. At regular intervals an operator rides slowly along on the carriage and applies this lubricant to the cable hot. The lubricant penetrates the cable and forms a coating on its exterior.

The traveling carriage supplied at Rockport is equipped with the patented Panama type shock absorbing fall rope carriers. These carriers are carried on a horn mounted at the rear of the carriage and on the out trip they are picked off this horn at regular intervals by buttons on the guide rope above the cable. They serve to support slack on the endless travel rope and the hoist ropes and prevent these ropes from dipping in the water. The horn automatically picks up these carriers on the return trip.

The Lidgerwood Manufacturing Company representation on the Pacific Coast has recently been reorganized. The Lidgerwood Pacific Company, a new organization, has taken over the extensive business with the lumber, industrial, and marine interests of the Pacific Northwest. Robert S. Smilie and Company of San Francisco are handling the complete Lidgerwood line for northern California.

The Rockport cableway was installed under the direction of Robert S. Smilie, whose long experience with Lidgerwood has given him a valuable fund of information on hoisting and conveying problems.

Offshore end tower of the Lidgerwood cableway at Rockport showing also the erection at the inshore end of the loading wire for vessels.

New Astor Yacht

POSSIBLY the most interesting yacht contract that has been let in recent years is that for the new large, seagoing diesel yacht that is now under construction for Vice-Commodore Vincent Astor, whose name has been so many years associated with yachting in this country.

The new yacht, which has been designed by Theodore E. Ferris in association with Cox & Stevens, is essentially a heavily built, substantial, seagoing craft of rugged design and having the appearance more of a special type of naval vessel than of the conventional yacht.

The new boat, which is of very large size, as the dimensions given below will show, has unusual freeboard, a straight and slightly raking stem, cruiser stern, machinery and stack being located amidships, and there being two large pole masts to carry steadying sails and to be used for signalling purposes. the dimensions are as follows:

Length over-all	263′ 10″
Length at waterline	260′ 0″
Beam	41′ 6″
Mean load draft	16′ 0″

The machinery consists of two Sulzer diesel engines of sufficient power to give the yacht a sustained speed of 15½ knots. Fuel, water, and stores can be carried sufficient for extended ocean voyages, and the whole conception of the design is to produce a vessel specially adapted for off shore work, while at the same time most comfortable for cruising along the American coast.

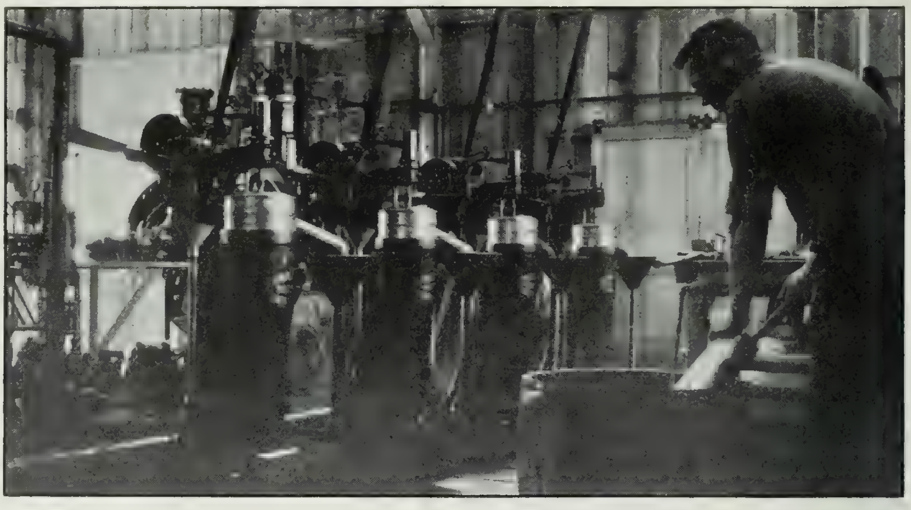
Full advantage has been taken of the possibilities afforded by the large dimensions of the yacht to lay out most comfortable quarters. Three large cabins each with bath for the owner and guests are placed on the main deck just forward of amidships where they will have perfect ventilation and will be as free from motion and engine room noises as any part of the ship. In addition, there are six large and comfortable staterooms with four baths for guests on the berth deck aft. The dining room will be forward on the upper deck, having a superb view from its windows and there will be, in addition, the usual other public rooms, consisting of a library and living room—all of generous dimensions, comfortably and harmoniously furnished and decorated.

The New York Yacht Club is to be congratulated upon the fact that so notable a yacht will shortly be added to its fleet. This yacht is to be built in Germany, probably at Krupps. Too bad that this American money could not patronize American shipyards.

R. W. Clark With Westinghouse

R. W. CLARK has joined the publicity department of the Westinghouse Electric & Manufacturing Company in charge of marine publicity and advertising, reporting to Lesley C. Paul, manager of the transportation section of that department.

Mr. Clark was born at Amsterdam, New York, in 1895 and was graduated from the United States Naval Academy, class of 1915. He completed a course at the Navy Submarine School, New London, Connecticut, in 1919. Mr. Clark resigned from the Navy in 1920 and was assistant editor of the Nautical Gazette for a year. Since that time he has been in newspaper work and has done free lance writing on marine subjects. All of this experience has given him an excellent background for the work he has taken up with the Westinghouse company.



SHARPLES AFLOAT AND ASHORE

The rapidly expanding commercial fisheries of the Pacific Coast are requiring the services of much engineering talent to make available for commercial purposes many by-products and to reduce operating expenses. The illustration above shows a battery of four Sharples supercentrifuges employed at the cannery of the Goss Packing Corporation, Hecate, British Columbia, for reclaiming fish oil.

At the left is shown a scene on board the purse seiner Ribac. The Ribac is one of the largest boats of her class on the Pacific Coast. She was built by Yarrow of Victoria, British Columbia; is engined with an Atlas-Imperial diesel engine; and is equipped with Sharples supercentrifuges, insuring clean lubricating and fuel oil.

Air-Driven Portable Hand-Saw

AN AUTOMATIC portable hand-saw, operated by compressed air and doing five times the work of an ordinary saw in the hands of a workman, has been devised by the Ingersoll-Rand Company, 11 Broadway, New York. This saw, now being sold to railroads, building contractors, lumber yards, shipbuilding plants, and other fields of utility, reduces sawing costs from 50 to 75 per cent below the cost by the old hand-saw method.

By a mere shift of blades, the pneumatic hand-saw may be put to work in sawing wood, soapstone, Bakelite, wallboard, cables, copper, and other materials. Cross-cut or rip blades for different types of work are available. It cuts timber, does trimming work on buildings and scaffolding; and it is used by railroads in car repair work. It is as adaptable in its application as it is economical in its operation. The 8-inch size weighs only 23 pounds.

One outstanding feature of this new air saw is its safeguard against accidents. The design combines the Ingersoll-Rand 3-cylinder type of air motor, long in use in I-R grinders and light-weight drills, with the Crowe safety saw guard. This guard has been officially approved by the Ohio Industrial Commission, by the Pennsylvania Department of Labor and Industry, by the New Jersey Department of Labor, and by the Underwriters' Laboratories.

The safety guard is of a telescopic nature. It opens when the saw is applied to the material; and it automatically closes and locks in position as the cut is completed. It affords complete protection against accident or damage to the blade. The saw guard has an adjustable stop so that the saw can be set for the required depth of the cut.

Automatic, portable hand-saw as arranged by Ingersoll-Rand for compressed air drive.

The 3-cylinder air motor is of the balanced type, smooth running, and free from breakdowns. All wearing parts, including the cylinders, are renewable. The cost of upkeep is almost negligible. The saw is being manufactured in three sizes, known as B6, B8, and B12, and takes 6-inch, 8-inch, and 12-inch blades, respectively. It is a labor, time, and money saver in every field in which it is in use.

New Step-Back Relay

A NEW step-back relay introduced by the General Electric Company is designed for use in direct current magnetic control equipment to provide overload protection and to allow a suitable time delay before reset.

This relay is a combination of two more or less distinct parts. The upper part consists essentially of a normally closed contact whose open or closed position is controlled by a coil in series with the motor armature. Loads in excess of the relay setting cause this normally closed contact to open, dropping out the step-back and accelerating contactors and thereby inserting enough resistence to limit the motor current to 125 per cent normal full load with stalled armature.

The lower part of the relay prevents the overload mechanism from resetting until after a definite time interval during which time the motor has a chance to become stabilized. If, after this definite time delay, conditions have again become normal and the motor current has decreased to a safe point, the overload mechanism resets and the control panel automatically accelerates the motor in the regular manner. However, unless the current decreases below a certain point, the relay will not reset. In this event the motor will have to be disconnected from the line and restarted from rest.

The principal use for the new relay at present is on marine equipments for anchor windlasses and capstans, although it is expected to be of value wherever it is necessary to maintain the torque and at the same time provide overload protection.

Rich System on Steamship New York

THE steamship New York, the new Hamburg American liner, docked at New York on April 11. This ship is a 21,000 tonner of the Albert Ballin type.

The steamship New York has two features of particular interest to Americans. In the first place she was christened at her launching a few months ago by Mrs. James J. Walker, wife of the Mayor of New York City. The second feature is the Rich System of fire detecting, the one American product on this German ship.

The Rich System consists of a system of piping running from each hold to a detecting cabinet in the wheel house. By means of a blower, samples of air from the cargo spaces are constantly being conveyed to the wheel house. Any smoke is immediately drawn through the pipe and makes its appearance in the detecting cabinet. On the steamship New York the Rich System of detection is combined with a steam smothering system in such a fashion that detection and extinction are accomplished through the same pipe.

The Rich System, although an American product, is standard equipment on the new large Hamburg American Line steamships. It has always been the policy of this line to equip their boats with the best of safety devices, thus insuring their reputation, as well as the safety of their passengers and crew. The Rich System, being a smoke detecting system, detects a fire at its inception, allowing for extinction with a minimum of damage to cargo and with no alarm to the passengers. All the sister ships of this new liner are equipped with Rich; namely, the Albert Ballin, the Deutschland, and the Hamburg.

Stelliting Dredge Cutters

FOR certain types of digging, the modern suction dredge is unsurpassed. It is continuous in operation and will handle tremendous volumes of sand, gravel, mud, and clay. Many of these materials are highly abrasive, and all parts of the handling machinery are therefore rapidly worn away. The action is particularly severe on the blades of the rotary cutter. This is usually a steel casting having 5 or 6 spiral blades, extending from an annular base and terminating in a heavy central section attached to the drive shaft. The drive shaft with cutter in place is supported on a heavy frame known as the ladder. One end is hinged to the dredge deck, so the outer end, bearing the cutter, can be raised or lowered by means of a boom. Suitable gearing transmits power from an engine on deck to the drive shaft and cutter.

Mounted on the underside of the ladder is a suction pipe, extending beyond the end of the frame into the space between the drive shaft and the cutter. As the cutter loosens the dirt, it is drawn into the suction pipe by a powerful centrifugal pump, and then forced out through the discharge pipe to the point of disposal. Obviously the cutter blades wear very rapidly; replacement is an ever-present problem, increasing in seriousness as the dredges are used in more remote localities.

Recently a dredge was sent to a South American harbor. It was known that the digging was such that the life of the rotary cutter would be only about six weeks. As this is a steel casting about 4 feet in diameter and 4 feet long, weighing about 3500 pounds and worth $800 f.o.b. the American foundry, the question of a duplicate for replacement immediately arose.

Each of the six cutter blades is about 12 inches wide, the cutting edge being 3/8 inch thick, increasing to about 1 inch at the rear end. Use wears the blades down until 4 or 5 inches wide, when replacement is necessary.

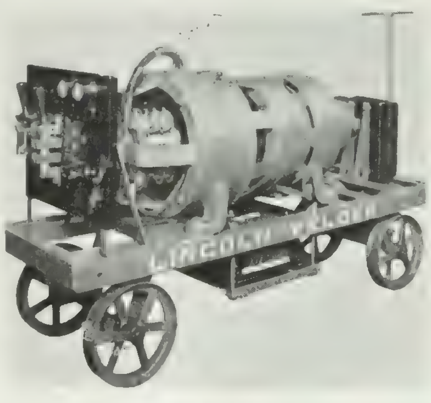
In view of the expense of the cutter and the possible delays in delivery, it was proposed to protect the cutting edges with Stellite, an alloy having exceptional wear-resisting properties, thus increasing the useful life materially. For this purpose a band of Stellite about 4 inches wide and 25 inches long was to be applied along the inside and outside faces of the cutting edge of each blade. (This Stelliting process is based on the fact that Stellite melts at a lower temperature than steel and adheres very tenaciously when properly applied. It is used in the form of welding rod and an oxy-acetylene blowpipe furnishes the heat necessary to melt the alloy and control its application.)

Welding was complicated to a certain extent by the curvature of the blades, which made it necessary to change the position of the cutter at brief intervals. The Stellite coating was 3/16 to ¼ inch thick, 150 pounds of the alloy being required for the six blades. The casting was very rough and had been painted, all of which tended to impede the operation. It therefore took about 105 hours to complete the work.

This protecting layer brought the total cost of the cutter up to $1700, a little more than twice the cost of the unprotected casting. Judging from similar applications, the life of the cutter should be increased many times, so the extra investment is more than justified. The actual life of this Stellited cutter will be watched with interest.

Welding Machine of Welded Steel

AMONG the many interesting developments in the machinery building field is the substitution of welded structural steel in place of gray iron castings. The 1927, 300 ampere, alternating current power supply Lincoln "Stable-Arc" welder illustrated shows the welded steel idea carried out to its logical conclusion. There are only two gray iron castings, weighing about 15 pounds total, on the entire outfit which have not been replaced with welded steel construction. Other sizes and types are being changed over to steel construction as rapidly as possible. The motor and generator end rings, brackets, and connecting ring are all made of structural angles rolled up into the proper shape and welded together. The feet of the motor generator set are made of drop forgings. The truck wheels are made of T-sections rolled on a special machine. The hub of the wheel is made of steel tube. Control panels are usually made of slate or special nonmetallic compounds, but the panel illustrated is made of sheet steel welded together and welded to the supports.



Lincoln portable welding outfit built almost entirely of welded steel shapes.

The underlying idea in the application of the principles of welded steel construction to the Lincoln "Stable-Arc" welder was to meet the severe conditions to which portable welding equipment is subjected. Failure in operation of a welding machine is, in many cases, a serious matter. It is claimed that the steel construction, due to the fact that it will bend rather than break, reduces the liability of failure for the reason that the bent parts may be straightened and the equipment put in operation without waiting for replacement castings. In several cases, the control panel has been crushed with instruments and switches wrecked. However, the equipment was repaired by straightening the panel and switches and put into operation within an hour without the instruments.

TRADE NOTE

The Griscom-Russell Company of New York, manufacturers of power plant auxiliaries, including the well known Reilly Evaporators and Reilly Oil Heaters and a complete line of heaters, coolers, evaporators, and filters for use in connection with steam, have announced the appointment of C. F. Henderson as agent for the San Francisco territory. Mr. Henderson will have offices at room 542 Call Building. The Griscom-Russell Company maintains representation in all the principal cities of the United States and Canada.

Eliminating Leak Losses

LEAKY joints around the piping system of an engine room are not only disagreeable but wasteful. Disagreeable because the drips, sometimes very hot, are liable to hit the engineer on the back of the neck, causing profanity and loss of temper. Wasteful, because any escape of liquids flowing through pipes except in the direction intended is a waste. Hot steam, fuel oil, or water so escaping is not doing useful work, so is wasteful. While the amount of loss at any one leak might not be large, many of them together will make quite a difference in fuel and power used.

To prevent such leaks compounds of various sorts have been employed for years. An old, but practically obsolete method was the use of red lead thinned with paint oil. This was smeared on the threads of screwed points, before making up, and in a way served the purpose intended. But if ever it became necessary to break a joint it was a difficult thing to do, and would seldom or never make up tight again. Powdered graphite mixed with oil has also been used, but this again, while easily separated, did not at all times make a tight joint, especially so if the threads were broken or bruised.

However, a new product has lately been perfected after much research by the Alloys Company, a subsidiary of the Merrill Company Engineers, which it is claimed solves all the problems of making tight joints which at the same time can be disassembled and reassembled repeatedly without injury. The basic material of this new compound is powdered metallic lead, finely enough divided to permit of its remaining in suspension in a liquid vehicle and which can be mixed to any desired consistency by the addition of water. Under heat the compound becomes tighter, and it is claimed it will resist acids, gasoline, or oils, as well as forming an ideal joint for steam and water. The U. S. Bureau of Standards in one of its bulletins states that lead filings used as a seal for pipe threads withstood a pressure of 8500 pounds per square inch without leaking.

In addition to the use of this new product as a lute for pipe thread joints, it can be employed in effecting boiler repairs in the case of patches bolted in place. Flanges, gaskets, manhole plate joints, etc., can all be made tight by Merco, the trade name of the compound. Its uses are many, and no doubt the marine engineer will find numberless places where Merco can be advantageously applied. It is claimed that when once put in the joint is always tight. It needs no "follow up" by wrenches, and though tight from the start can be readily removed if necessary. This advantage will commend itself to the marine engineer, as the making of joints in a steamship engine room is usually done under stress of short time to do the job in as well as the unpleasant conditions of heat and cramped quarters. Consequently anything which will insure a certainty of a joint holding will be a boon to the operating engineer.

The use of Merco pipe joint compound has been highly recommended for joints around oil fuel systems, either for steam or diesel jobs. As by it joints will be tight for good and all, the unsightly mess of dripping leaks will be banished from the engine room, much to the comfort of the man in charge, as all good engineers take a pride in the neat appearance of their plants. And no matter how well designed a piping system may be, if any of its hundreds of joints leak the general effect is ruined.

Reports from those engineers who have used the Merco compound are most highly satisfactory, all agreeing that it is about the best they have ever seen. And the operating engineer is the court of last resort in such cases, for if the material used fails after a hot and disagreeable job of placing it, then the engineer will most assuredly condemn it without reserve or apology. The Alloys Company, of 121 Second Street, San Francisco, is represented by C. V. Lane, Ford and Geirrine in the Balfour Building.

And not only for marine uses can Merco be applied, because it is just as efficacious in a shore side job. Here, too, the good engineer desires an engine room free from drips and leaks, which are both unsightly, disagreeable, and wasteful, but may be made tight and economical by proper jointing material, which the manufacturers of Merco claim is the latest and best offered. No doubt there are also many places in industrial plants where it can be applied to advantage, particularly around places where acids and corroding liquids are handled.

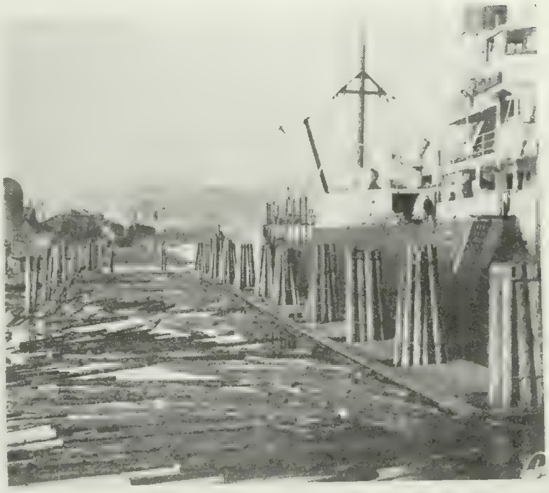
Ira Short

WESTINGHOUSE ENGINEER PROMOTED

IRA SHORT, formerly gear engineer of the Engineering Department at the South Philadelphia Works, Westinghouse Electric & Manufacturing Company, has been recently promoted to the position of marine engineer. Mr. Short was born in Woodville, Michigan, in 1890. He graduated from the North Carolina State College with the degree of B.S. in Mechanical Engineering, and in 1911 entered the apprenticeship course of the Westinghouse Electric & Manufacturing Company at East Pittsburgh. In 1912 Mr. Short was transferred to the condenser engineering department, specializing on condensing apparatus as applied to marine installations. He remained in this work until 1917 when he was transferred to the marine engineering department. Mr. Short continued in marine engineering work until 1923 at which time he was promoted to the position of gear engineer, continuing in this capacity until his recent appointment at marine engineer.

During his work with the Westinghouse company, Mr. Short assisted in designing propulsion equipment for a number of United States Navy destroyers and merchant vessels. He also carried out considerable development work on gears. Mr. Short is an associate member of the American Gear Manufacturers Association.

Short Logs for Export



Japanese steamer Koyu Maru loading hemlock logs direct from the pond at the Eureka Cedar Lumber and Shingle Company's Plant No. 2, Cosmopolis, Grays Harbor, Washington.

A UNIQUE and practical ship-loading berth is now being used at Grays Harbor for handling the short hemlock and cedar logs in demand in Japanese markets. This ship mooring and loading berth consists of a long row of 19-pile dolphins linked together by a 10-foot floating platform running the full length of the berth. The heavily constructed dolphins are substantial moorings for any freighter, while the float, in addition to forming one side of a log boom, provides a reasonably safe working place for the "hook-on" men of the longshore gangs. A short dock at the upper end of the 800-foot berth gives access to and from the ship. The mill company trims and saws the logs and dumps them directly into this shipside boom. This form of berth practically eliminates raft tow and charges and the hanging of a raft on the offshore side of the ship where longshoremen have to work in swift water and on nonbuoyant logs.

The ship's loading gear picks up the logs directly from the boom. Hemlock logs in particular have been found easy to handle in this way. These logs are small and are easily grouped into slingloads for hoisting aboard ship. The speed of loading and the saving of towing bills and labor outlay have justified the initial expense. Logs are held in reverse and shifted to the boom to comply with the ship's lumber order, while the cull timber is easily shifted to a different portion of the boom and out of the way.

The increasing demand in the Japanese lumber trade for short hemlock and cedar logs has been responsible for the construction of many small mills and the starting of small timbering operations handling nothing but that commodity. A number of the larger concerns in the Grays Harbor district now cut short logs exclusively. Shipments of this commodity have, during the past few years, grown into millions of feet annually.

New Steamers for Admiral Line

THE Pacific Steamship Company has recently acquired two modern up-to-date steamers to operate between Portland, San Francisco, Los Angeles, and San Diego. These two steamers, the Mary Weems and Esther Weems, operated on the East Coast between Baltimore, Philadelphia, and Miami, were owned by the Baltimore and Carolina Steamship Company. Delivery of these vessels was made on the East Coast the early part of April, and the steamers will commence operating on the Portland route the early part of June this year.

These vessels were built in 1918 and further improved in 1924. They are 312 feet long and over 5000 deadweight tons. Each steamer carries approximately 200 first class passengers. Excellent accommodations are provided for a large number of automobiles. The majority of the staterooms are two berth outside rooms and all rooms are equipped with hot and cold running water. There are a number of deluxe rooms with twin beds, private bath, and shower and toilet. In addition to carrying a large amount of general cargo there is also available a certain amount of refrigerated space.

Upon arrival on the Pacific Coast these two steamers will be renamed after two American admirals. They will be operated between Portland, San Francisco, Los Angeles and San Diego in conjunction with the steamers Admiral Dewey and Admiral Schley now on that route, furnishing two sailings a week between Portland and California.

H. F. Alexander, president of the Pacific Steamship Company, states that the passenger and freight business on the Portland route has shown a satisfactory improvement each year and in order to build up the route and furnish the patrons with the best service possible these two vessels were acquired.

America's Best Customers

OF THE twelve best customers of the United States, listed by the Department of Foreign Commerce of the Chamber of Commerce of the United States in its review of Our World Trade for 1926, three might be regarded as next door neighbors.

The United Kingdom heads the list, taking, during the year, American exports valued at $972,385,000. Canada is second, with $738,475,000. Cuba is seventh in the list with $160,488,000, and Mexico eleventh, with $134,994,000.

Canada, Cuba, and Mexico together took more than a billion dollars worth of exports in 1926—more than a fifth of the export total. These three countries are also to be found among the first twelve of the countries supplying the United States, Canada standing at the head of the list, Cuba fifth, and Mexico eighth.

Is Europe Slipping?

THE record of exports from the United States to the six grand divisions of the world, compiled by the Foreign Commerce Department of the Chamber of Commerce of the United States, raises the question whether Europe will long hold her place as America's greatest market.

Of the six divisions, only Europe shows a decline, the exports to that region for 1926 being $2,309,706,000, compared with $2,603,750,000 for 1925, a decline of approximately $300,000,000.

Exports to North America increased from $1,138,354,000 in 1925 to $1,176,884,000 in 1926.

Europe is now in second place in the value of exports to the United States. Imports from Asia in 1926 totalled $1,400,601,000, and from Europe $1,285,870,000.

Marine Insurance

Edited by JAMES A. QUINBY

Barge Case Significant

A DECISION recently handed down by the Federal District Court in San Francisco, and not yet reported, denied the right of the Erickson Navigation Company to limit liability in connection with the sinking of the barge Pyramid, on July 26, 1926, in San Pablo Bay. The matter appears worthy of comment here, for, while no new principles of law are involved, the valuation of fact and custom affirms a well-established precedent which may have an important effect on bay and river transportation.

The barge, in tow of tugs operated by, and in one case owned by, the Erickson Navigation Company, opened up and sank on a voyage from Sacramento to San Francisco. The owners filed a petition for limitation and exemption from liability for damage and loss of cargo, believing that only the damaged barge need be surrendered.

Before the case came to trial, however, the Supreme Court of the United States handed down its decision in the Salz case, discussed in this column last month, holding that as to a contract of carriage, tug and tow under single ownership must be considered a single agency of transportation, and, by inference, that both must be surrendered to gain the benefit of limitation. The action consequently developed into an adjudication of the question of liability only, with the barge owners being represented by Harold Sawyer, and the cargo-owners and insurers by Derby, Single, and Sharp and Thacher and Wright.

How Many Barges Are Unseaworthy?

Evidence adduced at the trial tended to show that the barge was old and that certain parts of the frame-timbers were not in good condition. Further evidence indicated that she was improperly loaded. Bills of lading were not issued until after the accident.

In fairness to the Erickson people, it must be admitted that they apparently did all that the average barge-owners would have done to keep the Pyramid afloat, and yet their contention that "perils of the seas" was responsible for the loss was difficult to prove. She apparently opened up and sank.

Melancholy Melodies

III.

"If——"

(You've heard that old one about "the parson told the sexton and the sexton tolled the bell?" Well, in this one, the underwriter tells the broker. But, after all, that's what brokers are for.)

We're sending back your claim. The loss
Is not within our perils clause.
Besides, the survey's full of flaws.
If we were technically liable, we'd pay it.

Although the sum involved is small
We've other claims that one and all
Upon this claim must stand or fall—
If it wasn't for the precedent, we'd pay it.

Our Head Office sets our limit—
Now if we alone were in it
We would pay you in a minute.
If it wasn't for New York we'd surely
pay it.

L'envoi

And if the bare truth we should tell
Our business hasn't done so well
The balance sheet's all shottahell—
If it wasn't for the overhead, we'd pay it.

J. A. Q.

One of the cargo owners had insured his goods in the same insurance company which had issued a policy covering the hull of the barge. The barge owners unsuccessfully advanced the somewhat novel argument that this insurer, having paid both losses—hull and cargo, was estopped to deny the seaworthiness of the barge, since their surveyor had passed her for hull insurance.

Judge St. Sure's opinion follows.

"The petitioner, in his petition, reading from paragraph V thereof, alleges as follows:

" 'That the said sinking of the said barge, and the consequent loss of it and damage to the cargo on board thereof, resulted solely and entirely from a peril of the sea, and did not result from any contributory fault, negligence, or carelessness, whatsoever, on the part of those having charge of the loading, and the navigating of said barge, or from any fault or negligence in the manner in which said barge was manned and equipped, and in any event said sinking and the consequent loss of and damage to the cargo was without the privity or knowledge of the petitioner.'

"The affirmative is upon the petitioner to prove the allegations of its petition. It seems to me, from the evidence in this case, that the evidence fails to support the affirmative; in other words, it appears to me that the testimony quite clearly shows that the barge sank, not as a result of any peril of the sea. The testimony shows that it was a clear day; there was a light wind, a wind that has been described as a fresh wind, a wind blowing about twenty miles an hour. There has been some testimony to the effect that the waves caused by the wind and tide were two and a half to three feet high—not more than that. From the testimony of Captain Early, who was in charge of the barge at the time that the accident happened, it appears that the water did not break over the barge. He says that the barge sprang a leak, and that the water came in from below. He has related to us how one of the men on the barge informed him that the water was boiling up from below, which would indicate that the boat or the barge

Arthur M. Brown **EDWARD BROWN & SONS** *Arthur M. Brown, Jr.*
MARINE DEPARTMENT—*Harry W. Browne, Manager*
PACIFIC COAST GENERAL AGENTS
THE GLOBE & RUTGERS FIRE INSURANCE CO., INC.
200 BUSH STREET, SAN FRANCISCO

FIREMAN'S FUND
Insures Hulls, Cargoes,
HEAD OFFICE: CALIFORNIA and SANSOME

JOSEPH HADLEY,
European Agent
3 LOTHBURY, E. C
LONDON

E. A. VALENTINE, Resident Agent for Oregon
714-715 BOARD OF TRADE BUILDING
PORTLAND, ORE.

FRANK G. TAYLOR, MANAGER, PACIFIC NORTHWEST BRANCH

had sprung a leak in its bottom. The testimony of Anderson, the boat builder and repairer, is to the effect that he examined the boat after the accident and he found that the knuckle had started amidships which would corroborate the testimony of Captain Early that the boat sprang a leak in its bottom and sprang it amidships. The springing of the leak might have been caused by a structural weakness in the boat; it might have been caused by a careless or negligent loading of the boat; it might have been caused from either of those causes, or both, but surely it was not caused from any peril of the sea. I think that the petitioner has wholly failed to show that he is entitled to the relief he has asked for in the petition, and it is, therefore, denied.

"Using due diligence to make the vessel seaworthy . . . is included in the order that I have just made. It seems to me it was the duty of the owners to show that the barge was seaworthy. I think they wholly failed in that. There is testimony here to the effect that this barge had a bad reputation on the waterfront. The testimony shows that it was assembled for Alaska, in 1900—it was built for the Alaska trade. While the testimony as to its history is somewhat hazy, it appears, at any rate, that it was regarded as a poorly-constructed boat. There is some testimony as to its being too long. At any rate, it seems to have been an unfortunate barge, and one of bad reputation on the front. While as I say, this is somewhat indefinite, it seems to me that the evidence supports the contention here that it was not a seaworthy barge, and it was not in a seaworthy condition. Its owners ought to have known that. It was their duty to know it. It was their duty to keep it in good condition. If it were not a barge that could safely be used in the trade, they ought not to have used it, they ought not to have taken any risk with any such barge."

Cheap Commodities

WHEN our leading oil companies decided to dig up the well-known hatchet and go on the warpath, the rank and file of our local gas hounds chortled in glee because they could acquire their favorite brand of perambulating coal-oil at a cent or so a gallon less than the cost of production. And when the war is all over, and the big fellows have collected the usual indemnity from the little fellows, they'll all join hands and pass the cost of battle on to our long suffering friend, John W. Consumer.

When the producers of any commodity enter into cut throat competition, the benefit to the consumer is largely imaginary. It is true that a temporary benefit may be taken of a low price on a standard article when the future market does not enter the picture, but this situation rarely exists. In the insurance field, the consumer derives the greatest economic benefit, not from the cheapest coverage at a given time, even though it may prove satisfactory, but from the market that will offer a steady protection at a reasonable rate.

This something-for-nothing graft is largely a variation of the old installment system, anyway. If it is carried over into the marine insurance field, it has a strong flavor of commercial cannibalism. After all, your insurer and your banker are really partners in your business, whatever it is. Whatever hurts the insurance market in the long run hurts you.

Think this over the next time a sensational ratecutter walks in your front door.

Jettison Damage as General Average

UNDER the first and second rules of the York-Antwerp Rules of 1890, it is well established that jettison of deck cargo is not made good in general average, but it is equally true, although sometimes overlooked, that damage caused by such jettison is general average damage.

In the case of the Felix, 1926 A M C 338, the District Court in New York recently confirmed the inclusion of jettison damage in general average. In February, 1914, the Felix loaded a full cargo of mahogany and cedar logs at Belize, British Honduras, for delivery to New York . The bill of lading, duly issued by the master and accepted by the shipper, provided that general average was to be paid in accordance with the York-Antwerp Rules of 1890, Rule I of which specifies that "no jettison of deck cargo shall be made good in general average."

On the morning of February 28, the Felix went aground on Cosgrove Shoal. In spite of repeated efforts, the ship could not be floated, even though her tanks were emptied in the hope of lightening her. A strong wind sprang up, and the master ordered part of the deckload jettisoned for the safety of ship and cargo.

In accordance with this order, sixty logs were cast overboard, after which the vessel was successfully floated. During the jettison, however, certain damage was done to the upper works of the ship, and some of the logs drifted aft, fouling the propeller and breaking one of the blades.

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Adjustment Includes Damage

In the subsequent adjustment, drawn up by Johnson and Higgins of New York, the value of the sixty logs was not allowed as general average, but an allowance was made for the damage mentioned above.

The cargo owner and his underwriter denied liability for that portion of the general average resulting from the jettison damage, contending that the provision of Rule I of the York-Antwerp Rules included damage incidental to deckload jettison.

The court, however, ruled against this contention, and upheld the adjusters in the following language:

"Any attempt to extend the scope of Rule I by implication to include all consequences of jettison would conflict with the express terms of Rule II, which provides that 'damage done to a ship and cargo, or either of them, by or in consequence of a sacrifice made for the common safety . . . shall be made good as general average.' Rule II is not in terms or by reasonable implication limited to jettison of cargo other than deck cargo. All damage occasioned by a sacrifice for the common safety must be made good. To limit its application to a jettison of cargo, which must itself be made good, would violate the Rule.

"Rules I and II together supply the directions applicable to the adjustment in issue. Under Rule I the value of the deck cargo jettisoned is excluded. Under Rule II the damage to the vessel by the sacrifice for the common safety is made good . . ."

The New Longshoremen's Compensation Act

THERE has for many years been a crying need for federal legislation providing compensation for maritime workers. The disadvantages of the present system—or lack of it—are obvious. A seaman may, according to the jurisdiction and circumstances, obtain heavy damages in a suit against his employer, or he may get nothing. Or he may come under some one of the various compensation acts of the several states, which are by no means uniform. This uncertainty has been a heavy burden on the employe and employer alike, and has rendered scientific liability underwriting almost impossible.

In the dismal light of this situation, any attempt at uniform legislation is a step in the right direction. With this comforting reflection, we turn to a brief examination of the so-called "Longshoremen's and Harbor Workers' Compensation Act," passed on the last day of the 69th Congress, and approved by the President on March 4.

According to our good friend Captain W. C. Petersen, who recently returned from Washington, D.C., Congress passed the bill in an absent-minded moment during a lull in the memorable filibuster between the outstanding members of the Reed family concerning who was the biggest crook in Pennsylvania and how much he got for it.

"Yes," says the Captain, "the Committee of the House passed on it, then reported it. The House passed it without a single member reading it or knowing what was in it. The Senate passed it the same way, and the President signed it. And now everybody will try to interpret the bill in the light of the intent Congress had when it was passed."

Seamen Excluded

At the insistence of Andrew Furuseth, of the International Seamen's Union, seamen were excluded from the benefits of the measure. It is hard to see why Agitating Andy was so distrustful of the bill. The way shipowners frown upon it, one would naturally expect their employes to embrace it with open arms.

In various sections, the act shows traces of the original inclusion of seamen. In Section 2, Sub. sec. 3, it is provided that "the term 'employe' does not include a master or member of a crew of any vessel, nor any person engaged by the master to unload or repair any small vessel under eighteen tons net."

In the next sub-section, however, we read that "the term 'employer' means an employer any of whose employes are employed in maritime employment, in whole or in part, upon the navigable waters of the United States (including any dry-dock.)"

In Sec. 3 (a) it provides that compensation shall be payable only if disability occurs on navigable waters and if recovery through workmen's compensation proceedings "may not validly be provided by state law." Since the state compensation bodies in the past have not been able to determine the extent of their jurisdiction, we anticipate that those in charge of the federal measure will have some difficulty in deciding where one jurisdiction stops and the other begins.

The basic provisions of the act are not revolutionary. Every employer must be liable for and shall secure to his employes the payment of the compensation provided, which is somewhat more generous than the highest rate now allowed by a state body. Under the federal measure, the award is based upon wages of $8 to $25 per week, the beneficiary to receive 66 2/3 per cent of his wage for an arbitrary number of weeks. The maximum claim for death or disability is $7500. A fine

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of $1000 is provided for the employer who docks the wages of his men in order to build up a compensation fund, and any agreement by an employe to waive his right to compensation is expressly declared invalid.

Choice Where Third Persons Are Liable

In Sec. 33 it is provided that if the employe is injured by the fault of some person other than his employer, he may elect to take compensation or sue the wrong-doer for damages. If he takes compensation, his employer is subrogated to the extent of such payment, to rights of the employe against the third person.

When a death occurs and there is no survivor eligible to receive compensation, the employer must pay $1000 into a special fund for the vocational rehabilitation of injured employes.

The administrative provisions of the act went into effect at the time of its passage, and the remainder become effective on July 1, 1927.

Taking it all and all, it is not a particularly good measure, but it is certainly better than none at all.

"Bursting of Boilers"

IT has long been debated whether a hull insurer is liable for a boiler or shaft which breaks down under tests to which it is subjected for the purpose of proving its fitness. Those who have denied such liability will gain small comfort from the decision of the District Court in the New York case of the steamship El Mundo, 1926 A.M.C. 1449.

The three boilers of the El Mundo were subjected to the annual hydrostatic test required by law. The boilers were supposed to have a capacity of 1000 pounds pressure, and the test was to have involved only 300 pounds. When the testing pressure reached 275 pounds, the port boiler burst. Some time later, after the vessel had been in service, it was discovered that the starboard boiler was cracked and leaking.

In attempting to recover under the Inchmaree Clause of their hull policies, the vessel owners tried to link the failure of the second boiler to the explosion of the first. The court, however, found that there was no causal connection, and that the assured was not entitled to recover as for a latent defect, since, even if there were a latent defect in the material of the boiler, the loss was merely that defect becoming patent, and did not involve resultant damage to hull or machinery.

As to the port boiler which burst under test, the assured claimed to recover both under the perils clause in his Iota form of policy, and under the Inchmaree Clause in the same policy, which specifically includes "bursting of boilers." On this point the Court comments as follows:

"The respondent argues that such an accident was not fortuitous, but caused by the deliberate act of determining whether the boilers would burst under the prescribed pressure. I cannot agree with this reasoning. On the contrary, the test seems to me to be usual, and the bursting furtuitous and unusual. The boiler had a theoretical strength of 1000 pounds and a prospective life of double the time of service it had seen. The real objection to the claim for damages is that the case has no exact judicial precedent, but that objection seems to be insufficient when the Perils Clause insures against losses from 'causes of whatsoever nature arising on shore or otherwise,' and the Inchmaree Clause expressly insures against 'bursting of boilers.' The analogy sought to be drawn to the case of Newton Creek Towing Co. vs. Aetna Ins. Co., 163 N.Y. 114, does not seem sound. There it was held that damage caused by deliberately forcing a vessel through the ice was not covered by a marine policy insuring a vessel against 'any accident caused by collision.' The vessel was purposely taken through an ice field in the hope that she would not suffer injury, and did not merely come in contact unexpectedly with floating cakes of ice. Such an impact was held not to be within the nautical definition of a collision. In the same way in the case of Magnus vs. Buttemer, 11 C.B. 876, damage from a ship's deliberately taking ground on the falling

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of the tide for convenience in unloading was held neither a stranding nor other peril of the seas within the terms of an insurance policy. . . .

"In the present case there was no purpose to burst the boilers, but in a test required by the government, and directed by its agents, the unexpected happened. If a spot in the metal weak enough not to stand the strain of the test, though showing no imperfection under any practicable test, be regarded as a defense, neither the sweeping words of the Perils Clause, nor the words 'bursting of boilers' in the Inchmaree Clause will furnish protection. In almost any conceivable case the insurer can lay as good a foundation for proving that the bursting was from wear and tear, or depreciation, or inherent vice, as it has done by the speculative and tenuous evidence in this case. I think a ground of recovery has been established in the case of the port boiler. . ."

While cases of this sort are extremely infrequent, the decision is significant in that it evidences a certain judicial attitude toward the Inchmaree Clause. This clause also bears the words "breakage of shafts." If a shaft is drawn for examination, suspected of containing a crystallized area, and breaks under the hammer test, is the insurer liable?

Trade Literature

American Brown Boveri Electric Corp. has issued two new descriptive circulars of interest to those engaged in plans for shipping expansion, port improvement, and waterways programs. These are Nos. 900 and 901 and cover **Hydraulic Dredges** and **Floating Pipe Lines for Hydraulic Dredges.**

Besides their extensive shipbuilding and manufacturing work, the American Brown Boveri Corporation includes as an important part of their activity the design and construction of hydraulic dredges. Circular No. 900 covers in detail the sizes, principal types, capacities, and equipment of the hydraulic dredges for any purpose, together with photographs of dredges in operation and close-up photographs of cutters. Circular No. 901 covers the pipe lines used in connection with hydraulic dredges, with special description of American Brown Boveri ball joints and spring joints.

The use of generator air coolers is steadily increasing as the advantages of a dust-proof, moisture-proof and fire-proof closed cooling system for generator windings are becoming more generally appreciated.

The **Griscom-Russell Co.** has just published a new bulletin on this important subject which is of interest to all power plant executives and engineers. This bulletin explains the application of generator air coolers, describes the special features of the U-fin cooler, includes a list of representative central stations and industrial plants equipped with this apparatus, and contains several illustrations of typical installations and arrangements.

Free copies of this bulletin may be obtained by writing to The Griscom-Russell Co., 285 Madison Ave., New York City.

100 Years of Steel Improvement is the title of a book recently issued by the **International Nickel Company,** 67 Wall Street, New York.

This booklet is printed as part of the program of this organization to enlighten users of steel concerning the improvements in alloy steels and particularly in "the oldest alloy steel—nickel alloy steel," and contains technical data, important historical dates in the development of nickel alloy steel, and present day uses of this material. Copy of the booklet may be had by applying to this magazine or to the main office of the company.

Black & Decker Electric Tools, is the title of Catalog No. 14 (1927) issued by The Black & Decker Mfg. Co., Towson, Maryland, and now ready for distribution to all interested parties.

This catalog contains 43 pages of complete description, specifications, and illustrations of the electric tools manufactured by the company, including electric drills and stands, electric screw drivers and socket wrenches, bench and pedestal grinders, twist drill grinders, portable electric grinders, portable electric tappers, portable valve grinders, valve refacers, and attachments and accessories for all these tools. A supplementary price list is included. This catalog should be in the hands of all manufacturing, building, and contracting firms who wish to keep abreast of the latest developments in machine tools and equipment.

Follow the Silvery Highway. This is a delightful brochure prepared by Stephens Bros., boat builders of Stockton, California, and describing the joys of boating on upper San Francisco Bay and the Sacramento and San Joaquin River systems. A thousand miles of winding waterways invite the boatowner to explore the rich California valleys. And to the northward there are many rivers, Klamath, famous for fishing, the Coquille in a virgin forest country, the mighty Columbia, and the many streams and vast inland salt water stretches of the Puget Sound country and the coasts of British Columbia and Alaska. No end of water, salt and fresh, waiting to be explored.

The booklet is illustrated with stirring pictures of the Stephens line of standard runabouts and cruisers, beautifully built, adequately powered, and luxuriously equipped. This line of standard boats comprises three specialties—the Stephens 26-foot runabout, the Stephens 40-foot cruiser, the Stephens 50-foot cruiser.

Hunt-Spiller Gun Iron for Marine Service is the title of a booklet describing a very high grade cast iron as made and distributed by the Hunt Spiller Manufacturing Corporation of Boston.

Hunt-Spiller Gun Iron is of great strength and possesses high wearing qualities and is therefore greatly recommended for use in marine engines for cylinder liners, for snap or spring cylinder rings, for sectional cylinder rings and springs, for piston heads on bull rings. It is especially valuable for uses where parts are subjected to high temperatures, as in steam engines using high degrees of superheat and in oil engines. On locomotive service this material has demonstrated its usefulness to such an extent that it is standard specification for many parts. In transatlantic service there are rings of Hunt-Spiller Gun Iron in steam service for 60,000 miles, showing negligible wear and practically no steam leakage.

Hunt-Spiller Gun Iron is carried in stock by The Moore Dry Dock Co., San Francisco

American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Shipbuilding Work in Prospect

THREE FAST FIREBOATS PLANNED

The City of Portland, Oregon, through the City Council will shortly call for bids for three fast fireboats for the protection of waterfront property. Plans have been practically completed by A. D. Merrill, naval architect, who will supervise their construction.

Each fireboat will be 85 ft. 11 in. long, 5 ft. 6 in. draft. The extreme height will be 12 ft. 6 in. so the boats can pass swiftly under the bridges without waiting for draws to open. They will have a speed of from 18 to 20 miles an hour.

Four pumps, capable of delivering 2000 gallons of water a minute at 200 pounds pressure will be installed on each boat. Each boat will be powered with four engines. Two engines will be used to propel the vessel to the scene of the fire (with pilot house control) when they can be switched over to drive the pumps, together with the two remaining engines.

NEW FERRYBOAT BUILDING

The County Commissioners of Multnomah County, Oregon, have engaged W. F. Gilder of Portland to design and construct a new ferryboat for St. Johns.

WARD LINE MAY PURCHASE TRANSPORT COMFORT

Captain William Clark, general superintendent of the Clyde Mallory Lines, and Theodore E. Ferris, naval architect of New York, were recently in San Francisco to inspect the former U. S. Army transport Comfort, with the idea of purchasing and reconditioning the steamer for operation by the Ward Line. The vessel was placed on drydock at The Moore Dry Dock Company. The machinery of the vessel is said to be in first-class condition, and the vessel one that will readily lend itself to conditioning for the Atlantic Coastwise service.

TO BUILD FLEET OF FISHING BOATS

The Patricia Corporation of Wilmington, California, one of the largest fishing companies at Los Angeles, has announced the intention to build a fleet of large, fast, diesel-driven fishing boats to have a cruising radius of 5000 miles. Contract for the first of these was let on March 31 to the Terminal Boat Shop, Terminal Island, San Pedro. Plans were prepared by William Lambie and A. Young & Son, naval architects, from rudimentary designs by Capt. O. Moeda, Japanese fisherman. Details of construction and operation will be handled by the marine department of the Behrendt-Levy Company.

The boat will be 90 feet long. She will be equipped with her own refrigerating plant capable of handling 100 tons of fish, and will be driven by a 240-horsepower Worthington diesel engine.

SHIPPING BOARD TO DIESELIZE MORE SHIPS.

The Shipping Board on April 5 authorized Commissioner Benson to submit recommendations for dieselization of twelve more steamships with a view to taking immediate action to let contracts for the work. The Board also authorized the negotiation of contracts, subject to the Board's approval, for three more diesel engines contemplated in the original allotment of twelve vessels.

Conversion of these ships will bring the Shipping Board's diesel fleet up to twenty-five vessels. The Board now has seven motor ships in operation. All of these vessels as converted have proved themselves satisfactory.

NEW ATLANTIC COASTWISE VESSEL

The Chesapeake Steamshp Co., Baltmore, Maryland, are reported to be planning an additional steamship similar to their steamer City of Annapolis, which is now undergoing repairs after having been rammed and sunk by her sister ship City of Richmond. The City of Annapolis is a steel vessel 261.6 feet long, 53.1 feet beam, and 14.1 feet depth, equipped with triple expansion engines developing 2300 indicated horsepower. The vessel has a deadweight carrying capacity of 1923 tons.

The International Petroleum Company, Ltd., Toronto, Ontario, has asked for bids for the construction of a river type sternwheel towboat for shipment to South America. The boat is to be 200 feet long and equipped with steam engines.

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NAVY DEPARTMENT ASKS FOR BIDS ON SALT LAKE CITY

The Secretary of Navy called for bids to be opened April 16 for the construction of the hull of the light cruiser Salt Salt Lake City (CL 25) and the propelling machinery for the Salt Lake City and the Pensacola (CL24). Contracts for this work had been let about a year ago to the Wm. Cramp & Sons Ship & Engine Building Co., who have withdrawn from the agreements.

ALLAN CUNNINGHAM RECEIVES LARGE CONTRACT

Allan Cunningham, builder of auxiliary machinery, with headquarters at Seattle, Washington, has received the contract for all the electric deck machinery for the Standard Oil tanker District of Columbia, which is being converted to a motorship, with diesel-electric drive.

PLANS FOR RECONDITIONING OF MOUNT VERNON

With the announcement of General A. C. Dalton, president of the Merchant Fleet Corporation, that the hull of the Mount Vernon is in very good state of preservation, and could be reconditioned to provide a first-class passenger vessel for the transatlantic service of the United States Lines, comes the question as to the best plan for providing an efficient power plant and sufficient passenger accommodations to make the vessel a paying proposition.

General Dalton estimated that the vessel can be reconditioned as a coal burner for the sum of $2,000,000 and converted into an oil burner for $2,500,000. He further estimated that it would entail an expenditure of between $5,000,0000 and $6,000,000 to convert the Mount Vernon into a modern motorship. It was indicated by him that this mode of conversion would be advantageous in view of the fact that an expenditure of approximately $12,000,000 would be required to reproduce a motor ship of the Mount Vernon class.

The Mount Vernon has a speed of 20 knots, which would place her in the class of ships to which fast mail contracts would be allotted. The liner has a reputation of always having finished a voyage on schedule time.

It is reported that plans for the conversion of the passenger steamship Mount Vernon to diesel-electric propulsion, have been submitted to the Merchant Fleet Corporation by the Newport News Shipbuilding and Dry Dock Company.

The principal dimensions of the vessel are 706 feet 6 inches overall, 680 feet 4 inches between perpendiculars; 72 feet molded beam, 52 feet 6 inches molded depth to "B" deck, 32 feet 6 inches normal mean load draft; displacement 28,444 tons. Her power plant consists of four quadruple expansion engines and 7 single-end Scotch boilers, developing a speed of 20 knots.

Navy Awards Cruiser Contracts

The Navy Department has officially announced the award of contracts for the six light cruisers CL 26 to 31, bids for which were recently opened.

One cruiser each goes to Mare Island Navy Yard and to Bremerton Navy Yard, one to the Bethlehem Shipbuilding Corporation, Ltd., Fore River Plant, Quincy, Mass., one to the American Brown-Boveri Electric Corp., and two to the Newport News Shipbuilding & Drydock Corp.

Three private shipyards and two engine building companies offered bids. Bids were also submitted by the U. S. Navy Yards at Mare Island, California, and Bremerton, Washington.

Of the private companies, the Newport News Shipbuilding and Drydock Company submitted the lowest bids for two of the light cruisers. The General Electric Company submitted the lowest bids for propelling machinery.

The new vessels, under the limitation of arms agreement, must not exceed 10,000 tons displacement and must not be armed with larger than eight-inch guns.

The bids were invited on a time basis of completing three of the vessels in a period not exceeding 36 months and the remaining three in a period not exceeding 45 months. Stipulation was also made that not more than two of the vessels were to be constructed by the same firm.

For the construction of these vessels two classes of construction were presented to the bidders. Class one called for the construction of the vessels complete with hull, main turbines, gears, boilers, auxiliaries, and to include the installation of the ordnance and the ordnance outfit and any other articles furnished by the government. By the provisions of class two, the same plan was presented with the exception that the main turbines and gears are to be furnished by the government and are to be installed by the shipbuilders.

Simultaneously, bids were called for in the case of six sets of main turbines and reduction gears with the stipulation that one company

Continued on Page 19, Advertising Section.

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Recent Shipbuilding Contracts

Harbor Boat Works, San Pedro, Calif., has an order from Mark Jones, Los Angeles, for the construction of a 42-foot tuna cruising yawl; D. M. Callis is designer.

Wallace Bros. Bridge and Structural Steel Company, Seattle, has an order from the Union Oil Company of Calif., with headquarters in Los Angeles, for a steel tow barge 90 ft. long, 30 ft. beam, and 9 ft. depth; capacity 2550 barrels of refined oil.

J. C. Johnson's Shipyard, Port Blakely, Wn., has an order from Mike Mathison, Port Blakely, for a trolling boat to be 45 by 6 ft by 4 ft. 6 in. This yard also has an order from the Sunny Point Packing Co. for two scows, 62 by 18 ft. by 4 ft. 6 in.

Dravo Contracting Company, Pittsburgh, Pa., has an order from the Ohio River Sand Company for two steel barges 130 by 30 ft. by 7 ft. 6 in. This plant is also building two additional 120-horsepower stern wheel diesel towboats for stock; also two pontoon-type whirler boat hulls for their Contracting Department.

Howard Shipyards & Dock Company, Jeffersonville, Ind., has an order from the U. S. Army Engineers at St. Louis, for 20 steel barges to be 55 by 16 by 3 ft.

Nashville Bridge Company, Nashville, Tenn., is building three 140-ft. deck barges for stock.

American Bridge Co., Pittsburgh, Pa., has an order from the Rodgers Sand Co. for five barges 135 by 37 ft. by 7 ft. 6 in.

Midland Barge Company, Midland, Pa., reports a recent order from the West Virginia Sand and Gravel Company for four barges 100 ft. long; an order from the River Sand Co. for a dredge hull 131 ft. long; also an order for a 130-ft. hull from George Martin.

Newport News Shipbuilding & Drydock Co., Newport News, Va., has an order from the Merritt, Chapman & Scott Corp. for a barge 154 by 50 by 13 feet; keel is to be in May.

General Engineering & Drydock Company, San Francisco and Alameda, have received a contract from the Golden Gate Ferry Company for remodeling the ferryboats Fernwood and San Francisco. These two boats have been leased from the Key System Transit Company and will be renamed the Golden Era and the Golden Dawn.

Hibbs, McCauley & Smith, naval architects of San Francisco, have prepared the specifications and will supervise the work. The boats formerly carried passengers only but will be remodeled to carry automobiles. The decks will be raised and the entire lower structure formerly used to carry passengers will be torn out and fitted to carry about 65 automobiles.

Newport News Shipbuilding & Drydock Company has received award of contract from the Shipping Board for the installation of Busch-Sulzer diesel engines in the freighter Yomachichi. The shipyard bid $527,500 as the cost of doing this work.

Bethlehem Shipbuilding Corporation, Ltd., at their Fore River plant, Quincy, Mass., will undertake the work of installing McIntosh & Seymour diesel engines in the freighter West Grama on a contract from the Shipping Board calling for a cost of $575,000.

Above is a view of the ferryboat Fresno on her trials on San Francisco Bay. This is the first of six all steel, diesel-electric ferryboats being built for the Southern Pacific Railroad. The Fresno, Lake Tahoe, and Mendocino are building at the Bethlehem Shipbuilding Corp.; the Stockton and the Redwood Empire by The Moore Drydock Company and the Santa Rosa by the General Engineering & Drydock Co. All have Nelseco diesel engines. Four have General Electric and two have Westinghouse electrical equipment.

The Tietjen & Lang Plant of the **Todd Shipyards Corporation** was successful bidder for the work of installing Hamilton-M.A.N. diesel engine on the Shipping Board freighter Seminole. The work will cost $579,500.

Anderson & Cristofani, boat builders of San Francisco, have received from Hibbs, McCauley & Smith, San Francisco naval architects and marine engineers, an order for a 40-foot motor yacht tender for Ralph Ellis of Berkeley and New York. The boat is to be powered with a 40-50 horsepower Red Wing motor, giving the craft a speed of 10½ knots. The boat is to be named the Chow and is to be shipped East for a tender for Mr. Ellis' 10-meter Marconi rig racing sloop. Ralph Ellis is one of fourteen members of the New York Yacht Club, Larchmont Yacht Club, and Seawanhaka Yacht Club having 10-meter sloops built in Germany. These are to be completed in time for the inter-club yacht cruise and races on the East Coast.

KEEL LAYINGS

One derrick boat hull for T. Smith & Sons, by American Bridge Co.; four barges for Carnegie Steel Co.

Hull for Baton Rouge Car Terminal by Howard Shipyards & Dock Co., Mar. 30.

Socony 1 and Socony 5, steam tugs for Standard Transportation Co., by Staten Island Shipbuilding Co., Mar. 8 and 15.

Two steel barges for W. C. Kelly Barge Line by Chas. Ward Engineering Works, Mar. 7 and 22.

LAUNCHINGS

Mendocino, diesel-electric ferryboat for Northwestern Pacific Railroad by Bethlehem Shipbuilding Corp., Apr. 14.

Golden Poppy, diesel-electric ferryboat for Golden Gate Ferry Co. by General Engineering & Drydock Co., Apr. 2.

Signal, halibut boat for M. J. Iverson by Prince Rupert Drydock & Shipyard, Apr. 4.

Three steel motor patrol boats for U. S. Coast Guard by American Brown Boveri Electric Corp. during Mar.

Carl D. Bradley, self-unloading freighter for Bradley Transportation Co. by the American Shipbuilding Co., April 9.

Traveler, diesel ferryboat for Tri-State Ferry Co. by Howard Shipyards & Dock Co., Mar. 14.

Simba, cruiser for Stewart Edward White by Lake Washington Shipyards, Feb. 10.

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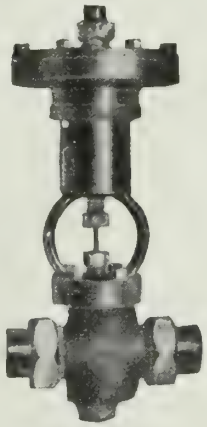
For Marine Pumps**



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Gulfsprite, twin screw motor tank barge for Gulf Refining Co. by Sun Shipbuilding Co., Feb. 26.

Steel Barge for W. C. Kelly Barge Line by Chas. Ward Engineering Works, Mar. 13.

Lake Tahoe, diesel-electric steel vehicular ferryboat for Southern Pacific Co., by The Moore Dry Dock Co., Mar. 23.

DELIVERIES

Kadiak No. 2, pile driver scow for Kadiak Fisheries Co. by J. C. Johnson's Shipyard, Port Blakely, Wn., Mar. 10; B.F. No. 1, No. 2 and No. 3, scows for Northwestrn Fisheries Co., Mar. 23 and 26; Tuxekan and Grindall, derrick scows for Northwestern Fisheries Co., Mar. 24 and 26.

Seven steel motor patrol boats for U. S. Coast Guard by American Brown Boveri Electric Corp., during Mar.; three carfloats for Reading Co. during Mar.

Towboat, owner not named, by Charleston Drydock and Machinery Co., Apr. 1.

Six steel hoppered cargo barges for Magdalena River, Colombia, by Marietta Mfg. Co.

Eleven barges for Inland Waterways Corporation by Midland Barge Co.

Meitowax, tugboat for Long Island Railroad Co. by Staten Island Shipbuilding Co., Mar. 5; steel caisson for Mid-Hudson Bridge, Mar. 20.

Peralta, double-ended screw propeller ferryboat for Key System Transit Co. by The Moore Drydock Co., Mar. 15.

Steel barge for W. C. Kelly Barge Line by Chas Ward Engineering Works, Mar. 11.

REPAIR AWARDS

Garbutt & Walsh, boat repair firm of Wilmington, California, has undertaken repairs to the purse seiner Sunlight due to damage to engines when the boat was submerged and damage to stern, as the boat was beached to save her from sinking. The work will cost about $10,000.

Progress of Construction

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT

Potrero Works, San Francisco

Purchasing Agent: O. W. Streett.

Fresno, hull 5331, double-end diesel-electric vehicular ferryboat for Southern Pacific Co., San Francisco; 256′ L.O.A.; 44′10″ beam; 19′ depth; four Nelseco diesel engines. 450 H.P. each; keel Nov. 8/26; launched Jan. 15/27; deliver April /27 est.

Stockton, hull 5332, sister to above; keel Nov. 20/27; launched March 5/27.

Mendocino, hull 5333, for Northwestern Pacific Railroad, sister to above; keel Jan. 20/27; **launched Apr. 14/27.**

GENERAL ENGINEERING & DRY-DOCK CO.,

Alameda, California

Purchasing Agent: Al. Wanner.

Golden Bear, hull 3, diesel-electric wooden auto ferry for Golden Gate Ferry Co.; 240′ L.B.P.; 44′ beam; 11′ 6″ loaded draft; 13 knots speed; 3-400 B.H.P. Ingersoll-Rand diesel engines, direct connected to Westinghouse generators; keel Oct. 28/26; launched Feb. 2/27.

Golden Poppy, hull 4, sister to above; keel Nov. 22/26; **launched Apr. 2/27.**

Golden Shore, hull 5, sister to above; keel Feb. 4/27.

Santa Rosa, hull 6, diesel-electric, steel automobile ferryboat for Southern Pacific Co.; 236′ L.B.P.; 44′ 10″ beam; 12′ 6″ loaded draft; 13 knots speed; 4-450 B.H.P. Nelseco diesel engs. connected to General Electric generators; keel Oct. 28/26; launched Mar. 17/27.

J. C. JOHNSON'S SHIPYARD

Port Blakely, Wn.

Kadiak No. 2, hull 94, pile driver scow for Kadiak Fisheries Co., Seattle; 65 by 24 ft.; launched Feb 2/27; **delivered Mar. 10/27.**

Hull 95, cannery tender for Sunny Point Packing Co., Seattle; 75 by 17 ft.; launch Apr. 12/27 est.; deliver May 5/27 est.

Selig No. 1, hull 96, fish scow for Capt. Steve Selig, Ketchikan, Alaska; 60 by 18 by 4ft.

B. F. No. 1, hull 97, scow for Northwestern Fisheries Co., Seattle; 60x18x5 ft. 6 in.; **delivered Mar. 23/27.**

B.F. No. 2, hull 98, scow same as above; **delivered Mar. 23/27.**

B.F. No. 3, hull 99, scow same as above; **delivered Mar 26/27.**

Tuxekan, hull 100, derrick scow for Northwestern Fisheries Co.; 70x24x5 ft. 2 in.; **delivered Mar. 24/27.**

Grindall, hull 101, derrick scow, same as above; **delivered Mar. 26/27.**

Hull 106, cannery tender and towboat for Sunny Point Packing Co., Seattle; 75x17 ft.; launch Apr.

WM. CORNFOOT, President GEO. RODGERS, Sec'y-Treas.

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12/27 est ; deliver May 5/27 est.

Ruth May, hull 110, trolling boat for Mike Mathison, Port Blakely, Wn ; 45x6x4 ft. 6 in.

Hulls 113-114, two fish scows for Sunny Point Packing Co , Seattle; 62x18x4ft. 6 in.

HANLON DRYDOCK & SHIPBUILDING CO.

Oakland, Calif.

No name, hull 91, tow barge for Union Oil Co ; 100 L.B.P.; 40 beam; 7ft. 6in. loaded draft; keel Feb. 21/27· launch Mar. 21/27 est ; deliver Apr 14/27 est

LAKE WASHINGTON SHIPYARDS.

Houghton, Wash.

Purchasing Agent: A. R. Van Sant.

Simba, cruiser for Stewart Edward White, 58 feet L.B.P.; 65 H.P. Washington-Estep diesel eng.; keel Oct. 11/26; **launched Feb. 10/27.**

Fishing boat for Geo. Brown, 65 ft. long; 80 H.P. Worthington diesel engines

Cannery tender for Libby, McNeill & Libby. Seattle; 75 ft. long; 2-50 H.P. Standard engs.

Fishing boat for Libby, McNeill & Libby, Seattle; 65 ft. long; 65 H.P. Washington-Estep diesel.

Scow for Libby, McNeill & Libby, Seattle; 66 ft. long.

Two river boats for Day, Seattle; ea. 65 ft. long.

Two river scows for Day, Seattle; 80 ft. long.

Cannery tender for Sunny Point Packing Co.; 50 ft. long; 100 H.P. Hall-Scott eng.

Troller for B. Thompson; 42 ft. long; 27 H.P. Acme eng.

LOS ANGELES SHIPBUILDING & DRY DOCK CORPORATION

San Pedro, Calif.

Barge No. 1, hull 53, oil barge for California & Eastern Oil Co., Los Angeles; 131 L.B.P.; 40 beam; 9-6 loaded draft; 1050 D.W.T.; keel Dec. 27/26; launch Feb. 7/27 est.

THE MOORE DRY DOCK COMPANY

Oakland, California.

Secretary and Purchasing Agent, Nat Levy.

Peralta, hull 170, double-ended, screw propelled ferryboat for Key System Transit Co.; 256 L.B.P.; 47 molded beam; 21 molded depth; 14.5 normal speed; turbo-electric propulsion; water-tube boilers; keel May 3/26; launched Oct. 14/26; **delivered Mar. 15/27.**

Yerba Buena, hull 171, sister to above; keel May 3/26; launched Nov. 22/26; deliver Apr. 20/27 est.

Lake Tahoe, hull 172, diesel-electric, steel, vehicular ferryboat for Southern Pacific Company; 236′ L.B.P.; 44′10″ beam 12′6″ loaded draft; 13 knots speed; 1250 S.H.P. Nelseco diesel engs.; connected to Westinghouse generators; keel Dec. 8/26; **launched Mar. 23/27.**

Not named, hull 173, sister to above; keel Dec. 8/26; launch Apr. 30/27 est.

PRINCE RUPERT DRYDOCK AND SHIPYARD

Prince Rupert, B.C.

One 75-foot tugboat for Granby Consolidated Mining, Smelting & Power Co.; 120 H.P. Washington-Estep diesel eng.; launched Feb. 3/27; deliver Apr. 15/27 est.

Signal, halibut boat for M. J. Iverson; 58′ L.O.A.; keel Feb. 1/27; **launched Apr. 4/27.**

W. F. STONE & SON

Oakland, Calif.

Purchasing Agent: Lester Stone.

No name, motor cruiser, for stock, 36x10x3½ ft.; 12 mi. speed; 65-HP. gas engines.

Northern Light, hull 824, yacht for John Borden; 140 L.B.P.; 30 beam; 14 loaded draft; 10 mi. speed; 360 I.H.P. diesel engs.; keel Sept. 1/26; launched Jan. 19/27; deliver May 1/27 est.

Aloha, hull 828, yacht for Frank B. Drake. 55 L.B.P.; 13 beam; 6 loaded draft; 7 mi. speed; 30 I.H.P. gas eng.; keel Aug. 25/26 deliver May 1/27 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY

Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Two towboat hulls for Carnegie Steel Corp., Pittsburgh; 149′ 2″ x 33′ 4″ x 5′ 10-5/16″; one delivered.

One derrick boat hull for T. Smith & Son, Inc., New Orleans; 110′x50′x10′; keel laid

30 coal barges for Carnegie Steel Co.; 175x26x11 ft ; 4 keels laid.

Five barges for Rodgers Sand Co.; 135x27x7ft. 6in.

AMERICAN BROWN-BOVERI ELECTRIC CORP.

Camden, N. J.

Purchasing Agent: L. G. Buckwalter.

Hull 329, steel motor patrol boat for U. S. Coast Guard, Washington, D.C.; 125 L.O.A.; 23′6″ molded beam; 220 tons displacement; Winton diesel engs.; keel Sept./26; launched Jan. 1/27; **delivered Mar./27.**

Hull 330, same as above; keel Sept./26; launched **Jan./27; delivered Mar./27.**

Hull 331, same as above; keel Sept./26; launched **Jan./27; delivered Mar./27.**

Hull 332, same as above; keel Nov. /26; **delivered Mar. /27.**

Hull 333, same as above; keel Nov./26; **delivered Mar. /27.**

Hull 334, same as above; keel Nov. /26; **delivered Mar. /27.**

Hull 335, same as above; keel Nov. /26; **delivered Mar. /27.**

Hull 336, same as above; keel Nov. /26; **delivered Mar. /27.**

Hull 337, same as above; keel Nov. /26; **delivered Mar. /27.**

Hull, 338, same as above, keel Dec. /26; **launched Mar. /27.**

Hull 339, same as above; keel Dec. /26; **launched Mar. /27.**

Hull 340, same as above; keel Dec. /26; **launched Mar. /27.**

Hull 341, same as above; keel Dec./26.
Hull 342, same as above; keel Dec./26.
Hull 343, same as above; keel Dec./26.
Hull 344, same as above; keel Feb. 1/27.
Hull 345, same as above; keel Feb. 1/27.
Hull 346, same as above; keel Feb. 1/27.
Hull 347, same as above; keel Feb. 1/27.
Hull 348, same as above; keel Feb. 1/27.
Hull 349, same as above; keel Feb. 1/27.
Hull 350, same as above; keel Feb./27.
Hull 351, same as above; keel Feb./27.

Hull 364, carfloat for Reading Co.; capacity 10 cars; keel Jan./27; **launched and delivered Mar./27**

Hull 365, carfloat for Reading Co., capacity 10 cars; keel Jan./27.

Hull 366, carfloat for Reading Co., capacity 8 cars; keel Jan./27; **launched and delivered Mar./27.**

Hull 367, carfloat for Reading Co., capacity 8 cars; keel winter /27 est.

Hull 368, carfloat for Reading Co., capacity 8 cars; **launched and delivered Mar./27.**

Hull 369, carfloat for Reading Co., capacity 8 cars; keel winter /27 est.

Hull 370, carfloat for Brooklyn Eastern Dist. Terminal, 340x38x11ft.; capacity 23 cars; keel Mar./27; launch and deliver June /27 est.

THE AMERICAN SHIP BUILDING COMPANY

Cleveland, Ohio.

Purchasing Agent: C. H. Hirsching.

Wm. McLauchlan, hull 793, bulk freighter for Pickands, Mather & Co.; 580 L.B.P.; 60 beam; 20 loaded draft; 13 mi. loaded speed; 12,000 D.W.T.; T.E. engs.; 2400 I.H.P.; 3 B. & W. boilers 200 lbs. pressure; keel July 19/26; launched Oct. 7/26; deliver Apr. 15/27 est.

Robert Hobon, hull 794, sister to above keel Aug. 9/26; launched Oct. 30/26; deliver Apr. 15/27 est.

L. E. Black, hull 795, bulk freighter for Inland Steel Co.; 596 L.B.P.; 64 beam; 20 loaded draft; 13 mi. speed; 13,500 D.W.T.; T.E. engs.; 2700 I.H.P ; 3 Scotch boilers, 24′6″x11′x185 lbs.; keel Nov. 8/26; launched Feb. 1/27; deliver Apr. 15/27 est.

Geo. M. Humphrey, hull 796, bulk freight steamer for Kinsman Transit; 580 ft. L.B.P.; 60 ft. beam; 20 loaded draft; 13 mi. speed; 12,000 D.W.T.; triple expansion engs.; 2500 I.H.P.; 3 Scotch boilers, 14x

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11; 159 lbs. pressure; keel Oct. 18/26; launched Dec. 30/26· deliver April 15/27 est.

Carl D. Bradley, hull 797, self-unloading bulk freighter for Bradley Transport. Co.; 615 L.B.P.; 65 beam; 20 loaded draft; 14 mi. speed; 13,000 D.W.T.; turbo-electric drive; 4000 I.H.P.; 2 water tube boilers; 325 lbs. pressure; keel Jan. 10/27; **launched Apr. 9/27**; deliver July 1/27 est.

Harry Coulby, hull 798, bulk freighter for Pickands, Mather & Co.; 607′ L.B.P.; 65′ beam; 33′ loaded draft; 13 mi. speed; 13,800 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 B. & W. boilers; 200 lbs. pressure; keel Feb. 7/27; launch Apr. 23/27 est.; deliver July 1/27 est.

Not named, hull 799, tug for Michigan Limestone & Chemical Co., 83′6″ L.B.P.; 24 beam; 12 draft; 12 mi. speed; compound engs. 900 I.H.P.; 1 fire tube boiler, 160 lbs. pressure; keel Mar. 1/27 est.; launch Apr. 9/27 est.; deliver May 1/27 est.

Not named, hull 800, bulk oil barge for Standard Transportation Co.; 258 L.B.P.; 40 beam; 10 draft; keel Mar. 21/27 est.; launch July 13/27 est.; deliver July 27/27 est.

Not named, hull 801, oil barge for Standard Transportation Co., sister to above; keel Mar. 21/27 est ; launch July 13/27 est.; deliver July 27/27 est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT

Quincy, Mass.

Lexington, hull 1300, airplane-carrier U.S.N., launched Oct. 3/25.

Governor Carr, hull 1401, ferryboat for Jamestown-Newport Ferry Co.; 150′x48′x14′; 703 gro. tons; keel Oct. 11/26.

Hull 1402, carfloat, N.Y., N.H. & Hartford R.R.; 360′x40′x11′6″; 1375 gro. tons; keel July 14/26.

Hull 1403, carfloat, same as above; keel July 15/26.

Hull 1404, carfloat, same as above; keel July 16/26.

Hull 1405, carfloat, same as above; keel July 16/26.

Hull 1406, oil barge for City Service Transport Co. 204′x35′6′x14′3″.

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT

Wilmington, Del.

Not named, hull 3511, oil barge for Seaboard Shipping Corp.; 170′x37′x12′6″; keel Oct. 12/26; launch Dec. 22/26 est.; deliver Dec. 29/26 est.

BETHLEHEM SHIPBUILDING CORP., BALTIMORE DRY DOCK

Baltimore. Md.

Hull 6136, carfloat for Western Maryland R.R.; 190′x35′x9′; keel Aug. 12/26.

CHARLESTON DRY DOCK AND MACHINERY COMPANY

Charleston, S. C.

Purchasing Agent: Charles R. Valk.

Towboat, owner not named; 64 ft. long; keel Nov. 17/26; launched Feb. 2/27; **delivered Apr. 1/27.**

Dredge for Gulf Refining Co.; 95′x30′x8′; keel Oct. 11/26; launched Dec. 7/27.

CONSOLIDATED SHIPBUILDING CORPORATION

Morris Heights, N. Y.

Hull 2867, cruiser for George G. Bourne; 81x14 ft. 6 in · 2 Wright Typhoon engs., 550 H P. ea.

Hull 2868, cruiser for Geo. F. Baker, Jr.; 70 x 12 ft. 6 in.; 2 Model R. Speedway engs., 300 H.P. each.

Hull 2870, cruiser for H. N. Slater; 60x10 ft. 10 in.; 2 Model M.R. Speedway engs.; **180 H.P.** each.

Hull 2872, cruiser for B. H. Borden; 95 x 16 ft.; 2 Model R Speedway engs., 300 H.P. ea.

Hull 2874, cruiser for Clifford V. Brokaw; 85x 14 ft. 6 in.; 2 Model R. Speedway engs. 300 H. P. each.

Hull 2875, cruiser for Adolph Dick, 54x11 ft. 6 in.· 2 Model M.R. Speedway engs., 180 H.P. ea.

Hull 2877, cruiser for E. W. Clark; 50x10; one Model M.R. Speedway eng., 180 H.P.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.

Philadelphia. Pa.

Purchasing Agent: Ed. C. Geehr.

Malolo, hull 509, **express pagr and frt liner, Matson Navigation Co.; 582 LOA; 577 length at water line; 83 ft beam; depth molded to C deck** 54 ft.; displacement 22,050 tons; 8250 **DWT;** speed 22 knots regular, 23 knots **maximum; 25,000 shaft horsepower;** Cramp-Parsons turbines; oil burning B & W water-tube boilers; keel May 4/25; launched June 26/26; deliver June 1/27 est.

Yarmouth, hull 518, twin screw passenger and **freight steamer for Eastern Steamship Lines; 378 length at water line; 55-6 beam; 29-6 molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears, six single-ended** Scotch boilers; keel Feb. 23/26; launched Nov. 6/26; deliver June 10/27 est.

Evangeline, hull 524, twin screw passenger and **freight steamer for Eastern Steamship Lines; 378 length at water line; 55′6″ beam; 29′6″ molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears; 6 single-ended Scotch** boilers; keel May 1/26; **launched Feb. 12/27;** deliver May 1/27 est.

Salt Lake City, hull 531, light cruiser for United States Navy; 10,000 tons displacement; keel Apr. 1/27 est.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

Purchasing Agent: G. O. Williams.

Comoco, hull 122, steel yacht for R. W. Judson, Detroit; 140′ L.B.P.; 23′6″ beam; 8′9″ loaded draft; 15 mi. speed; 260 D.W.T.; 600 I.H.P. diesel engs; keel Dec. 15/26; launch May 1/27 est.; deliver June 1/27 est.

Helen, hull 121, steel yacht, for Chas. E. Sorensen, Detroit; 105 L.B.P.; 17′ beam; 6′ loaded draft; 13 mi. speed; 110 D.W.T.; 200 I.H.P. diesel engs.; keel Nov. 1/26; launch Apr. 15/27 est.

DRAVO CONTRACTING COMPANY

Pittsburgh, Pa.

Hulls 501 and 502, 2 steel barges for stock; 230 **x45x11 ft.; 650. gro tons ea.**

Hull 534, 1 ladder type sand and gravel dredge for Pittsburgh Plate Glass Co.; 155x44x8ft., 430 gross tons.

Hulls 537 and 538, two steel whirler boat hulls for Contracting Dept.; 40x48x5′6″; 100 gro. tons.

Hull 539, 1 diesel engined towboat for Labelle Transportation Co., 110′x26′x5′; 215 gro. tons.

Hulls 540-543 inc.; 4 steel barges for Keystone Sand & Supply Co.; 135′x27′x8′; 320 gro. tons ea.

Hull 553-566 inc., 14 steel barges for Mississippi River Commission, Memphis; 120′x30′x7′4″; 430 gro. tons ea

Hulls 571 and 572, 2 steel hopper type barges for Pittsburgh Plate Glass Co., 135x26x10 ft. 320 gro. tons ea.

Hulls 577-578, 2 dump scows for Pittsburgh Plate Glass Co.; 110x26x8 ft. 6in.; 220 gro. tons. ea.

Hull 579, steam dredge for Ohio River Gravel Co.; 120 x 32 x 6 ft.; 200 gro. tons.

Hull 580, steel hull "A" frame derrick boat for Pittsburgh Plate Glass Co.; 72 x 34 x 5 ft.; 120 gro. tons.

Hulls 581-590 inc., 10 standard steel barges for stock; 100x26x6 ft. 6 in.; 135 gro. tons each.

Hulls 591-600 inc., 10 standard steel barges for stock, 100x26x6ft. 6in.; 135 gross tons each.

Hulls 601-604 inc., 4 steel barges for Keystone Sand & Supply Co.; 135x27x8ft.; 320 gr. tons ea.

Hulls 605-612 inc., 8 steel barges for Keystone Sand & Supply Co.; 135 x 27 x 8ft.; 320 gr. tons each.

Hull 613, steam dredge for stock; 2 cu. ft. capacity; 120x32x6ft.

Hull 614, one diesel engine towboat for stock; 110x26x5 ft.; 215 gro. tons.

Hulls 615 and 616, two 120-H P. stern wheel diesel towboats for stock; 74ft. 2in. x 16 ft. x 4 ft ; 320 gro tons ea

Hulls 617 and 618, two steel barges for Ohio River Sand Co.; 130 x 30 x 7 ft. 6 in.; 25 gro. tons ea.

Hulls 619 and 620, two pontoon-type whirler boat hulls, in 4 sections; each 10 x 40 x 4 ft. 6 in ; for Contracting Department; 92 gro. ton ea.

DUBUQUE BOAT & BOILER WORKS

Dubuque, Iowa

Purchasing Agent: A. L. Yehger.

Two steel dump scows for U.S. Engineers, Louisville, Ky.

Thorpe, river towboat for Upper Mississippi Barge Line Co. & Inland Waterways Corp.; 132′x35′ x3′6″; stern wheel, tandem comp. surface condensing engs.; 15″x30″x78″ stroke; keel Oct. 1/26 est.; launch Mar. 1/27 est.; deliver Apr. 1/27 est.

Weber, river towboat, sister to above; keel Oct. 1/26 est.; launch Mar. 1/27 est.; deliver Apr. 1/27 est.

Morse, river towboat, sister to above; keel Oct. 1/26 est; launch Mar. 1/27 est; deliver Apr. 1/27 est.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY

Kearny, N. J.

Purchasing Agent: R. S. Page.

Gulfpride, hull 86, tanker for Gulf Refining Co.; 525′ L.B.P.; 74′ beam; 28′ loaded draft; 11 knots speed; 17,400 D.W.T.; 4500 I.H.P. diesel engs.; keel June 15/26; launched Jan. 20/27; deliver Apr. 1/27 est.

Dixie, hull 89, passenger and freight steamer for Southern Pacific Steamship Lines, Pier 49, North River, New York; 427 L.B.P.; 60 beam; 25′6″ loaded draft; 6700 D.W.T.; De Laval steam turbines; 7700 S.H.P.; 4 B. & W. boilers, 21,900 sq. ft. heating surface; 16,000 sq. ft. superheating surface; keel Jan. 31/27.

Hull 90, carfloat for Lehigh Valley Railroad; 278 x39x10ft.

Hull 91, same as above.

Hull 92, same as above.

Hull 93, carfloat for D. L. & W. Railroad, 278 x39x10 ft.

Hull 94, same as above.

Hull 95, same as above.

GREAT LAKES ENGINEERING WORKS

River Rouge, Mich.

Purchasing Agent: Chas. Short.

H. F. Harvey, hull 256, bulk freighter for Pittsburgh Steamship Co., Cleveland; 580 L.B.P.; 60 beam, 20 loaded draft; T.E. engs.; 2200 I.H.P.; 3 Scotch boilers 12′ diam. by 11′6″; keel Jan. 3/27; launch Apr. 9/27 est.; deliver May 30/27 est.

S. T. Crapo, hull 256, bulk cement freighter for Huron Transportation Co.; 385 L.B.P.; 60 beam; 19 loaded draft ;11 mi. speed; 7200 D.W.T.; T.E. engs.; 1800 I.H.P.; 3 Scotch boilers, 12 ft. 9 in. diam.; keel April 15/27 est.; launch Aug. 1/27 est.; deliver Oct. 1/27 est.

HOWARD SHIPYARDS & DOCK COMPANY

Jeffersonville. Ind.

Purchasing Agent, W. H. Dickey.

Hull 1599, steel guide dock for E. T. Slider, New Albany, Ind.; 120′x24′x4′; keel Feb. 28/27; launch Mar. 4/27 est· deliver Apr. 5/27 est.

Hull 1600, same as above; keel Mar. 1/27.

Hull 1601, hull for Baton Rouge Car Terminal, Baton Rouge, La.; 285′x60′x9′6″; **keel Mar. 30/27.**

Traveler, hull No. 1603, diesel ferryboat for Tri-State Ferry Co., Cairo, Ill.; 100 L.B.P.; 30′ beam; 5′ depth; 9 mi. loaded speed; 125 D.W.T.; 6-cyl. diesel eng.; 180 I.H.P.; keel Jan. 3/27; **launched Mar. 14/27;** deliver Apr. 20/27 est.

Hulls 1605-1625, 20 steel barges for U. S. Army Engineers, St. Louis; 55 x 16 x 3 ft.

MANITOWOC SHIPBUILDING CORPORATION

Manitowoc, Wis.

Purchasing Agent: H. Meyer.

Hull 227, one car ferry for Grand Trunk Milwaukee Car Ferry Co.; 360′ L.O.A.; 58′ molded beam; 21′6″ depth; 2 T.E. engs.; 4 Scotch boilers; launch Jan. 19/27 est.; deliver Mar. 1/27 est.

MARIETTA MANUFACTURING COMPANY

Point Pleasant. W. Va.

Purchasing Agent: S. C. Wilhelm.

Thirty steel discharge pontoons for U.S. Army Engineers, Rock Island, Ill.; 38′x14′x3′2″; 3 launched.

One steel stern-wheel towboat for Magdalena River, Colombia; 168′ x 42′ x 5′; tandem compound engs.; keel laid; deliver July 1/27 est.

Twelve steel hoppered cargo barges for Magdalena River, Colombia; 125′x26x6′; **11 launched; 6 delivered.**

Wharf boat for city of Dubuque, Iowa; 214x45x 6ft 6in.; keel May 1/27 est.

Wharf boat for Minneapolis; 214x45x6ft. 6in.; keel May 15/27 est.

Wharf boat for St. Paul, 214x45x6ft. 6in.; keel May 30/27 est.

MIDLAND BARGE COMPANY

Midland, Pa.

Fifteen barges for Inland Waterways Corporation,

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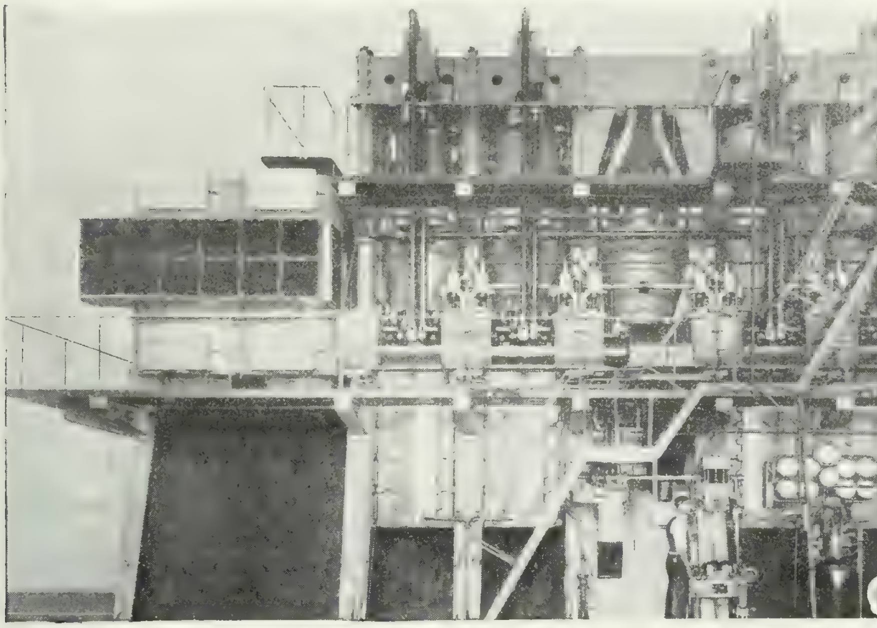
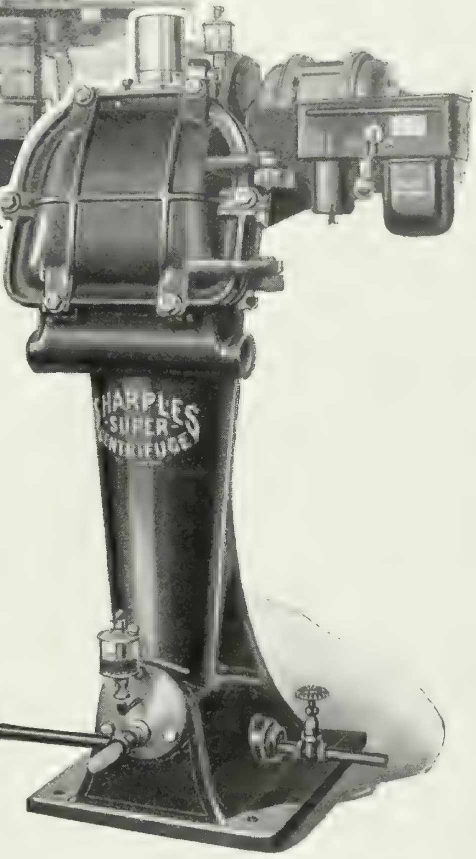
3 SHARPLES OIL PURIFIERS in 30-Day Government Test



on

HAMILTON M.A.N. 3300 S.H.P. DIESEL



During the 30-day full-load Government Test of the Hamilton M.A.N. 3300 s.h.p. double-acting Diesel Engine for the U. S. Shipping Board, three Sharples Oil Purifiers were used to clean the fuel and lubricating oil.

The Hooven, Owens, Rentschler Co., of Hamilton, Ohio—builders of this great engine—wisely safeguarded against shut-downs through impurities in the fuel and lubricating oils during this important test by installing Sharples Super Centrifuges for rapid and positive purification.

THE SHARPLES SPECIALTY COMPANY, 2326 WESTMORELAND STREET, PHILADELPHIA. The Sharples Specialty Company of California, 686 Howard Street, San Francisco. Boston, New York, Pittsburgh, Chicago, Detroit, Tulsa, New Orleans, Los Angeles, Seattle, Toronto. Super Centrifugal Engineers, Ltd., Aldwych House, London, W. C. 2, England; Ste. Ame des Appareils Centrifuge, 8 Rue du Helder, Paris, France; Tatsumi Commercial Corporation, Marine Insurance Building, Tokio, Japan.

SHARPLES

A GREAT FORCE

126'x33'x7'6". 6 keels laid; **11 launched; 11 delivered.**

Steel sand and gravel dredge hull for E. T. Slider, New Albany, Ind.; 175'x50'x6"; keel March 1/27.

One hull for Dillman Egg Case Co., 30x80x4ft.

Four barges for West Virginia Sand & Gravel Co.; 100x26x6ft. 6in.

One dredge hull for River Sand Co.; 131x30x5ft.

One hull for Geo. Martin; 130x32x5ft.

MIDLAND SHIPBUILDING COMPANY, LTD.

Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

City of Hamilton, hull 18, package freighter for Canada Steamships, Ltd.; 230 L.O.A.; 38 beam; 23 depth; T.E. engs.; keel Oct. 11/26; launched Jan. 12/27; deliver Apr. 15/27 est.

City of Montreal, hull 19, package freighter same as above; keel Oct. 11/26; launched Jan. 12/27; deliver Apr. 15/27 est.

Saskatoon, hull 20, package freighter for Canada Steamship Lines, Ltd.; 250 L.B.P.; 42 beam; 26 ft. 6 in. draft; keel Jan. 18/27; deliver May 15/27 est.

Weyburn, hull 21, sister to above; keel Jan. 18/27; deliver May 15/27 est.

NASHVILLE BRIDGE COMPANY

Nashville, Tenn.

Purchasing Agent: Leo E. Wege.

Hull 108, dredge, owner not named; clam shell bucket type; 110'x51'6"x8'; steam eng

Hulls 113 to 118 inc., deck barges for stock; keels Apr./27 est.

Hull 119, deck barge, for stock; 130x34x8 ft.; keel Apr./27 est.; launch May/27 est.

Hull 120, deck barge, for stock; 130x34x8 ft.; keel Apr./27 est.; launch May/27 est.

Hull 121, deck barge for stock; 140 L.B.P.; 32 beam; 6 loaded draft; keel May 15/27 est.; deliver Aug. 1/17 est.

Hull 122, deck barge same as above.

Hull 123, deck barge same as above.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas: Plummer, 233 Broadway New York City.

Iroquois, hull 306, passenger and freight steamship for Clyde Steamship Company, New York, 407'-3" overall, 62'-0" beam, 30'-6" depth, Newport News turbines and gear; 8500 I.H.P.; Scocth boilers; oil burning; keel March 20/26; launched Dec. 11/26; deliver Apr./27 est.

Shawnee, hull 307, sister to above; keel May 15/26; launch April 18/27 est.

California, hull 315, 18-knot, passenger liner for Panama Pacific Line, New York; 600 ft. long, 80 ft. beam, 52 ft. depth; watertube boilers for oil 22,000 gross tons; 17,000 I.H.P.; keel Mar. 20/26; launch Aug./27 est.

Northland, hull 318, coast guard cutter for U. S. Government; 216' long; 39' beam; 24'9" draft; diesel-electric propulsion; McIntosh & Seymour engs.; keel Aug. 16/26; launched Feb. 5/27; deliver May/27 est.

Caracas, hull 319, passenger and freight steamer for Red D Line, New York; 335'4" L.O.A.; 51' beam; 22' draft; Newport News turbines and gears; water-tube boilers; 3560 D.W.T.; 4000 S.H.P.; keel Nov. 18/26; launch June/27 est.

Hull 320, oil barge for U. S. War Dept.; 80x26x5ft.; keel Feb. 21/27; launch Apr./27 est.

Hull 321, barge for Merritt, Chapman and Scott Corp.; 154x50x13 ft.; keel May/27 est.

THE PUSEY AND JONES CORP.

Wilmington, Del.

Purchasing Agent: James Bradford.

Not named, hull 1031, single screw passenger **freight steamer for Baltimore & Philadelphia Steamboat Co., Philadelphia; 219 L.B.P.; 45 beam; 11 loaded draft; 14½ mi speed; 4 crank, TE engs. 21-32-35-35 by 24"; two B. & W. water-tube** boilers, 3046 sq. ft. heating surface each.

Peter Stuyvesant, hull 1033, steel single screw day steamer for Hudson River Day Line, New York; 252 L.B.P.; 46 beam; 4-cycle, triple expansion engs.; 2800 I.H.P.; 4 B. & W. water-tube boilers; 11x12 200 lbs. pressure; keel Sept. 15/26; launched Feb. 2/27; deliver May 1/27 est.

Not named, hull 1034, steel twin-screw diesel yacht from Henry J. Gielow, Inc., naval architect, for Col. Edward Green, New York, 294' L.O.A.; 38'3" beam; 16' loaded draft; 2 Bessemer diesel engs.; total of 3000 H.P.

STATEN ISLAND SHIPBUILDING COMPANY

Mariner's Harbor, N. Y.

Purchasing agent: R. C. Miller.

Meitowax, hull 768, tugboat for Long Island Railroad Co.; 108' L.O.A.; 26' beam; 13'2" molded depth; diesel-electric propulsion; keel June 16/26; launched Nov. 27/26; **delivered Mar. 5 27.**

America, hull 769, grain elevator for Inter. Elevating Co.; 130 L.O.A.; 35 beam; 9 loaded draft forward 11 loaded draft aft.; diesel engs.; keel Sept. 30/26; launched Jan. 27; deliver Apr. 15/27 est.

Hull 771, steel caisson for Mid-Hudson Bridge; **delivered Mar. 20/27.**

Hull 772, steel caisson for Mid-Hudson Bridge; **delivered Mar. 20/27.**

Socony 1, hull 774, steam tug for Standard Transportation Co.; 100 ft. 2 in. L. B.P.; 24ft. 1in. beam; 12ft. 3in. depth; 15 knots speed; comp. engs. 850 I.H.P.; 1 Scotch boiler 14ft. 9in. dia. by 12ft.; **keel Mar. 8/27;** deliver Aug. /27 est.

Socony 5, hull 775, steam tug, sister to above; **keel Mar. 15/27.**

SUN SHIPBUILDING COMPANY

Chester, Penn.

Purchasing Agent: H. W. Scott.

Gulfsprite, hull 102, twin screw motor tank barge for Gulf Refining Co.; 136'x27'x11'6"; 400 B.H.P. engs.; to carry 385 tons on 9' draft; 9 kts. speed; keel Dec. 2/26; **launched Feb. 26 27.**

Not named, hull 103, twin screw motor tank barge for Tidewater Oil Co.; 252' long; 40' beam; 14' depth; to carry 1885 tons on 12' draft; 10 kts. speed; keel Jan. 3/27; launch Apr. 9/27 est.; deliver May 5/27 est.

Not named, hull 104, single screw bulk oil steamer for Tidewater Oil Co.; 480' long; 65'9" beam, 37 feet depth; to carry 13,000 tons on 27'6" draft; speed 12½ knots. 4250 I.H.P.; keel Mar. 1/27.

No name, hull 105, motor barge for Beacon Oil Co.

No name, hull 106, 13,000-ton motor tanker for Sun Oil Co.

No name, hull 107, tanker for California Petroleum Co.

TOLEDO SHIPBUILDING CO.

Toledo, Ohio.

Purchasing Agent: Otto Hall.

Wabash, hull 177, car ferry for Wabash Ry. Co.; 388 L.B.P.; 57'6" beam; 16' loaded draft; 13½ mi. speed; 2500 D.W.T.; T.E. engs.; 2500 I.H.P.; 4 Scotch boilers, 14'6" diam.; keel Nov. /26; launch Mar. 19/27 est; deliver Apr. /27 est.

B. F. Affleck, freighter, hull 178, for Pittsburgh Steamship Co.; 580 L.B.P.; 60' beam; 19' loaded draft; 12½ mi. speed; 12,500 D.W.T.; T.E. engs.; 2500 I.H.P.; 3 Scotch boilers; 14' diam; keel Feb. 1/27.

TODD DRYDOCK & ENGINEERING REPAIR CORP.

Brooklyn, N. Y.

Purchasing Agent: H. J. Shannon.

No name, hull 40, diesel-electric ferryboat for Dept. of Plant & Structures, City of New York; 101 ft. 6 in. length over guards; 27 ft. 7 in. beam; 6 ft. 8¾ in. loaded draft; 300 I.H.P. Nelseco diesel engine.

No name, hull 41, diesel-electric ferryboat, sister to above.

THE CHARLES WARD ENGINEERING WORKS

Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Hull 54, steel barge for W. C. Kelly Barge Line; keel Sept. 29/26; launched Feb. 19/27; **delivered Mar. 11/27.**

Hull 55, same as above; keel Jan. 3/27; **launched Mar. 13 27.**

Hull 56, same as above; **keel Mar. 7/27.**

Hull 57, same as above; **keel Mar. 22/27.**

Hull 58, same as above.

Hull 59, same as above.

W. A. Shepard, hull 60, towboat for W. C. Kelly Barge Line; screw propeller, 2 Fairbanks-Morse diesel engs.; 720 B.H.P.; keel Sept. 23/26; launched Jan. 11/27; deliver Mar. 15/27 est.

Duncan Bruce, hull 61, **stern-wheel towboat, for W. C. Kelly Barge Line; 135'x35'x6'; Fairbanks-**Morse diesel engs.; keel Jan. 17/27; launch Apr. 30/27 est.

Not named, hull 62, diesel powered stern wheel survey boat for Mississippi River Comm., Dredging Dist., Memphis, Tenn.; 139'6"x24'x5'3".

Repairs

BETHLEHEM SHIPBUILDING CORP., UNION PLANT

Potrero Works, San Francisco

Drydock, paint, misc. repairs: Chas. Christenson, Coos Bay, Yellowstone, Paul Shoup, Dakotan, Santiam, Kewanee, Matsonia, Hawaiian, Korrigan III., Sugillenco, City of Papeete, Alvarado, Lubrico, Admiral Fiske, Ventura, U.S.A.T. Thomas, Maui, Betterton, Maweema, Barbara C, Sausalito, Martinez. Forged steel tail shaft: Maui, two extras for Sonoma, Sierra, or Ventura, 1 extra for Condor or Coya, 4 cargo pumps, 1 engine room bilge pump: District of Columbia. Propeller repairs: Robert Johnson, Coos Bay (also misc. repairs), President Lincoln. Cylinder repair: Lurline. Misc. repairs: Suscolanco, Carlos, Kansan, West Conob, Oregonian, San Pedro, Finland, West Ivan, Shell Barge No. 6, Maunalei, Texan, President Taft, Natica, Santa Paula, Necanicum, Makura, Minnesotan, Manchuria, Teespool, Missoula, Cathwood, West Elcajon, Elkridge, Maui, Lake Benbow, Kentuckian, Evanger, Wilhelmina.

Alameda Works

Drydock, paint, misc. repairs: Brookings, Santa Inez, Solano, Jane Nettleton, Barge No. 15, Star of Finland, Point Loma, Quinault, Tamalpais, Santa Inez (no repairs). Misc. repairs: Jane Nettleton, Necanicum, Maliko, Frank D. Stout, Raymond, Esther Johnson.

San Pedro Works

Dock, clean, paint, misc. repairs: West Carmona, Cape Ann, Daylight, Calawaii, Coalinga, Missoula, D. G. Scofield, Montrolite, S. C. T. Dodd, barge Pico. New tail shaft: Los Angeles. Propeller repairs, drydock: Oregon. Engine repairs: Wm. H. Doheny. Pipe repairs: Atlantic, Meline, Montauk, Socony 82. Docked for survey, misc. repairs: Hampton Roads, John C. Kirkpatrick. Telemotor repairs: Argon. Boiler repairs: tug Sea Witch. Misc. Repairs: Liss, Sudbury, Nora, Sujerseyco, San Patricio, Covena, Socony, Wallingford, Storstad, Lebec, Algonquin, Oaxaca, Mexican, Sugarseco, Hawk, Pennsylvanian, W. R. Chamberlain, Jr., Ramapo, Crampton Anderson, Santa Inez, Cerro Ebano, Atlantic.

ALBINA MARINE IRON WORKS.

Portland, Ore.

Purchasing Agent: W. O. W. West.

Voyage repairs to stmr. West Hixton, cost $1385.

GENERAL ENGINEERING AND DRY DOCK COMPANY,

Alameda, Calif.

Drydock, clean, paint: g.s. Phoenix, bktn. Centennial, schr. Doris Crane. Drydock, clean, paint, minor repairs: stmrs. Henrietta, Kanak, Griffdu, m.s. Alitak, ferry Harry E. Speas. Drydock: str. Achille Paladini, Chilkat, Kadiak. Dock, clean, paint, general repairs: stmrs. Kvichak, Brooklyn, Pasadena, Chehalis, schr. Doris Crane. Damage repairs, dock, clean, paint: stmr. Sea Rover. General repairs: str. Midway, Coalinga. Misc. repairs: stmrs. Brunswick, Helen P. Drew, launches Scout, No. 3440. Vessels listed last month, still undergoing repairs: stmrs. Elizabeth, Phyllis, Coquina, g.s. Elia.

THE MOORE DRYDOCK COMPANY,

Oakland, Calif.

Secretary and Purchasing Agent: N. Levy.

Drydock, clean, paint, misc. repairs: stmrs. General, Ernest H. Meyer, West Montop, Star of Lapland, Arctic (also tailshaft), Standard Service, Los Alomos, m.s. Brynje (also bottom damage and engine repairs), tug Virgil G. Bogue, ferry Fernwood. Drydock, paint, engine and deck repairs: stmrs. Plume, Frank H. Buck, Davenport (also unshipped rudder and wheel repairs), Edward T. Jefferey (also propeller instaled), Edwin Christensen. Drydock, paint, clean, hull and engine repairs: Crescent City, Daghestan. Drydock, clean, paint, deck repairs: Mauna Ala (also engine dept.) Drydock, clean, paint, hull repairs: West Ivan. Drydock, clean, paint, misc. engine repairs: Sonoma. Engine dept. repairs: Point Judith (also deck), Hagen (also deck and steering gear repairs). Engine and deck repairs: Anne Hanify. Furnish propeller: Brooklyn. Furnish new tail shaft and misc. repairs: stmr. Raymond. Misc. repairs: Dorothy Wintermote, Melville Dollar, Meton, S. C. T. Dodd, Makiki, Statesman, Wahkeena, Wellesley, Lubrico, Crockett, Seekonk, m.s. Patterson, U. S. C. G. cutter Bear.

PRINCE RUPERT DRY DOCK AND SHIPYARD,

Prince Rupert, B.C.

Docked, cleaned, painted, misc. hull and machinery repairs: tug Marmien. Docked, cleaned, painted, propeller blades removed, faired, and replaced; tailshaft removed; extensive hull and engine repairs: stmr. Prince Rupert. Docked, cleaned, painted, annual overhaul: C.G.s. Marfish. Docked, cleaned, painted, misc. hull and machinery repairs: 6 fishing boats. Misc. hull and machinery repairs: 30 fishing boats. 66 other commercial jobs.

U. S. NAVY YARD,

Bremerton, Wash.

Drydock, misc. repairs: Pennsylvania, Thompson. Misc. repairs: Tennessee, Robert Smith, Meyer. Misc. repairs incidental to operation as district craft: Mahopac, Swallow, Challenge, Pawtucket, Sotoyomo, Tatnuck.

TODD DRY DOCKS, INC.,

Harbor Island, Seattle, Wash.

General overhauling: H. F. Alexander. Repairs to extensive bridge damage: Eurana. Drydock, clean, paint: President McKinley, Denali, Derblay, Depere, Perry L. Smithers. Miscellaneous repairs: Sol Duc, Red Bird, Queen, Admiral Evans, Julia Luckenbach, Olympic, Ruth Alexander.

CHARLESTON DRY DOCK AND MACHINERY CO.,

Charleston, S. C.

Drydocked and repairs: stmr. Liberty Isle, West Mahomet. Repaired on railway: dredge P. U. Coin, yachts Tropic, Sangamo, Aaronellec, lighter N. S. L. Co., ferry stmr. Palmetto, tugs Jas. H. Clarke, Mars, stmr. Hildegarde, launch C. P. Day, barge Harlem.

Accident Prevention on Tank Steamships

By Arthur M. Tode,* Superintendent Technical Division, Marine Dept., The Texas Company

VIRTUALLY every accident on board ship is preventable. On this fact hinges the success or failure of an accident prevention campaign, which consists primarily of bringing home this message to every one connected with the shipping industry.

A careful study of the accidents which occurred on board vessels of The Texas Company's fleet during the years 1921 to 1925 inclusive, and an analysis of the injuries which resulted, made it apparent that relatively few of the accidents could be classed as unavoidable. In fact, the majority of the accidents could have been prevented by greater carefulness and watchfulness on the part of the men injured, and in cases, by co-workers who in some instances were partly and in others were entirely responsible for the accidents.

The problem of promoting safety on board ship resolves itself into one of education and proper supervision. The first part, that of education, consists in a mental training of all the personnel to think of safety and to follow out the principles which promote safety in their daily tasks. Recognizing that mechanical appliances play but a comparatively small part in accident prevention, and that the greater portion of accidents is attributable to the human factor, an effort must be made to arouse the interest of the worker in the safety of himself and his co-employes. The individual man on board ship must be taught that his safety depends largely upon himself, just as does the safety of others. The second part of the problem, proper supervision, requires the cooperation and assistance of every member of the marine department from highest executives to seamen, wipers, and messmen.

Don't rig a gangway near a steam hose. Don't use a gangway not securely lashed. Don't rig a gangway without the steps alongside.

Proper supervision must include men and machinery. The licensed personnel on the ships, who frequently complain of the inexperience of the men in their charge, must be taught to realize their own responsibility in this condition and make serious efforts to train and instruct the men under them.

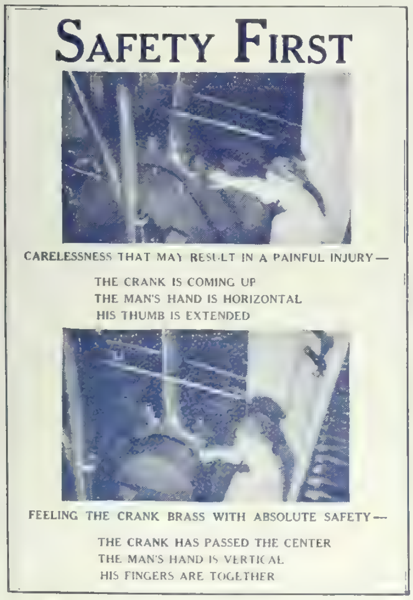
The marine department management in turn must find the ways and means to arouse an interest among the officers on the ships so that the principles of safety will, through them, be indelibly impressed upon the men. This is important because the turnover of the unlicensed personnel on the vessels is large in proportion to the officer personnel replacement.

The executives of a steamship company, especially one engaged in the oil tanker trade, when attempting to inaugurate or follow out an accident prevention campaign have not the same facilities or opportunities as are available in factory or plant management on shore.

Chief among the advantages offered the factory employer who is interested in reducing his list of accidents is the opportunity which his safety representative has of talking collectively and individually to the superintendents, foremen, and other employes of the various departments; the holding of safety first meetings and rallies at suitable times and places; the inspection of possible hazardous appliances, places, or conditions in the plant when reported; and the ability to investigate fully the causes of accidents as soon as they take place and analyze them with the view to preventing a recurrence.

Special Marine Problem

In contrast, let us consider what the marine department of a large oil company must contend with. Here there are a large number of ships carrying their cargoes of crude and refined oils to ports on the several continents. In the tanker trade a quick turn-about is of the greatest importance. Before reaching the loading port the crew of a tank vessel are busily engaged making all preparation to take on board the oil cargo immediately upon arrival. Not infrequently an oil tanker will reach her loading



CARELESSNESS THAT MAY RESULT IN A PAINFUL INJURY—
THE CRANK IS COMING UP
THE MAN'S HAND IS HORIZONTAL
HIS THUMB IS EXTENDED

FEELING THE CRANK BRASS WITH ABSOLUTE SAFETY—
THE CRANK HAS PASSED THE CENTER
THE MAN'S HAND IS VERTICAL
HIS FINGERS ARE TOGETHER

Safeguards will protect you but you must keep them in place.

---

*Address before Marine Section, National Safety Council.

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Monthly sailings between coast ports and Montevideo, Buenos Aires, Santos. SS. "West Camargo" departs from San Francisco May 10

Pacific-Havana-Jacksonville

S.S. "Munrio" in Munson-McCormick service departs from San Francisco May 10 for Havana and Jacksonville. Other sailings, too, to Caribbean ports.

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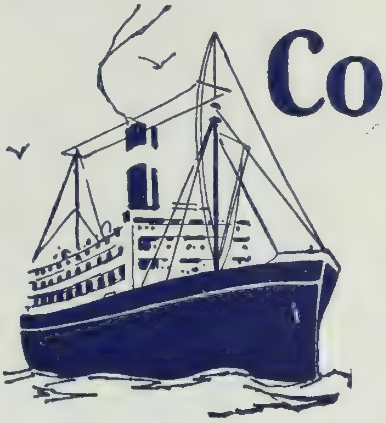

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*M.S. City of Panama..	May	14	May	16	†S.S. Ecuador	May	7	May	17
†S.S. Venezuela	May	21	May	23	*S.S. Corinto	....		May	14
*M.S. City of S.F.	June	4	June	6	S.S. Colombia	June	4	June	11
†S.S. Ecuador	June	11	June	13	S.S Venezuela	June	25	July	5
†S.S. Colombia	July	9	July	11	S.S. Ecuador	July	16	July	26

*Ports of Call—Mazatlan, Champerico, San Jose de Guatemala, Acajutla, La Libertad, La Union, Amapala, Corinto, San Juan del Sur, Puntarenas, Balboa and Cristobal.

†Ports of call—Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal and (Havana eastbound only), Cartagena and Puerto Colombia (Westbound only), and New York.

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port in the morning, and before the sun has set will have started on her return voyage. In the interim a cargo of some sixty thousand or more barrels of oil has been pumped into her tanks, several hundreds of tons of package freight securely stowed in the 'tween decks and holds, and bunker fuel, boiler feedwater, and commissary stores loaded. At the same time such repairs and adjustments have been made to the machinery as may have been required, and the many miscellaneous duties, both on deck and in the engine room, which must be attended to have received the proper attention.

Upon the vessel arriving at her discharging port a similar picture is presented. The safety representative of the oil company would receive little encouragement from the master or the chief engineer of the ship, who together with their men are exceedingly busy at these times, should he attempt under such conditions to talk to their crews on accident prevention. The safety representative of a general passenger or cargo steamship company whose vessels are in port from one to several weeks at a time, may perhaps have the opportunity of personally talking to and impressing upon the men the company's ideas of safety.

In the oil tanker trade the voyages of the respective ships are largely governed by the law of supply and demand—both domestic and foreign trade. With loading terminals on the southern and western coasts of the United States, in Mexico, and in South America, and with many discharging ports at home and abroad, it is difficult and in many cases impossible to determine the itineraries of the vessels for any considerable future period. Under these conditions the safety representative may not have the opportunity of visiting some of the ships except at very long intervals.

The Texas Company, upon serious consideration of the best means to reduce the accidents on board its ships, found itself confronted with the difficulties which have been briefly mentioned. It appeared that a good start toward reducing the number of accidents could be made by stimulating "safety thinking" among the seagoing personnel, by attempting to create good will for accident prevention work among the men and to remind them of the care that must be exercised to perform their duties with the highest safety for themselves and fellow workers. It was decided to display safety posters on all vessels of the oceangoing fleet, the barges, the tugs, and at the marine warehouses.

As the preparation of a large number of original safety articles and posters for display purposes would entail considerable time, the poster catalog of the National Safety Council was consulted. Of the many hundreds of splendid posters available through the National Safety Council, only a comparatively few are applicable to marine work. These, for the most part, have been contributed by the marine department of another large oil company. About seventy posters were selected with which to start an accident prevention campaign. Various types of bulletin boards for displaying the safety posters were considered and two sizes of boards chosen. The boards are of a neat appearance, one size being 18 inches by 24 inches over all, for the large vessels; the other being 18 inches by 12 inches over all, for the small fleet. A metal sign "Safety First" is attached at the top of each board. On the large ships two bulletin boards have been placed, each displaying two posters, the posters being changed weekly by the master of the vessel. On barges and tugs only one bulletin board has been installed, displaying one poster, changed weekly. Considerable thought was given to selecting the most desirable locations for the boards on every ship, that is, to select places where the majority of the crews would voluntarily or involuntarily be brought in contact with the department's ideas of safety. In the majority of cases the safety posters are being displayed simultaneously in the officers' mess room and in the crew's mess room, although in some instances other locations were selected.

All the bulletin boards and the complete sets of safety posters for the ships were assembled at one office and, together with complete instructions for their installation and display, were sent to the marine superintendents at the several terminals of the company for delivery to vessels upon next arrival in port. In addition, letters outlining the marine department's plans for lowering of the accident record were sent to all masters and chief engineers.

Consultations are being held with the officers of our ships along this line of work as the opportunity is offered. Their interest and cooperative spirit is gratifying and should be a strong factor toward a successful accident prevention campaign. Material is being gathered in order that original safety posters may be prepared by The Texas Company to be used when the present supply has been depleted. As these posters are finished from time to time copies will be submitted to the National Safety Council so that other steamship companies and allied industries may use them. Such cooperation, it is felt, should and does assist to promote safety at sea on board ships of those companies who are members of the marine section of the National Safety Council.

Selling the World

THE prevalent idea that manufacturers turn to foreign markets only when their output exceeds the domestic demand and a way must be found to dispose of the surplus no longer holds good, it is found by the Department of Foreign Commerce of the Chamber of Commerce of the United States. The American business man is developing the practice of selling in the world.

"In recent years," the Department says, in a handbook "Doing Export Business," issued for the guidance of prospective exporters, "it has been remarked time and again that new American products were being shipped to foreign countries in quantity very shortly after they had achieved national distribution or widespread distribution in the domestic market. Radio apparatus offers perhaps the most conspicuous example of this entrance into world markets before the home market had been intensively sold. Automobile equipment and toilet articles offer other examples. In some lines the existence and the desirability of the foreign market are so well known that new American products are put into export distribution at the same time that the product is put on the home market. Recently an American automobile manufacturer came out with a new car, and within a few weeks advertised here that his car was on the road in forty-two foreign countries."

Life on Pacific Coast Tankers

By Wm. P. Lindley

BY INVITATION of officials of the Union Oil Company of California, the writer made a coastwise trip on the Union Oil steam tanker Coalinga, joining the vessel at the company's dock at Los Angeles harbor. She had just come from the shipyard, where she had been put through her annual inspection and certified to as conforming in all particulars with the laws made and provided for safe operation of ships by the United States Steamboat Inspection Service. The Coalinga carries 70,000 barrels of fuel oil.

About five o'clock in the afternoon, three lines of heavy 6-inch hose were connected up to the filling pipes and fuel oil commenced to stream into the tanks at the rate of ten thousand barrels per hour. This work is carried on under most careful scrutiny so that every possible element of danger from fire may be eliminated. Test samples are taken to insure that the quality is kept standard. An elaborate system of bells and signals from tank pump house to ship and return makes it possible to check or stop entirely the flow of oil instantly. Early the following morning all was ready for sea, and with a bit of a pull from the tugs Fearless and Sea Prince the Coalinga was swung into the channel, and under her own power threaded her way down toward the outer harbor, Capt. Larson conning her by the naval vessels anchored there. At the breakwater light the log was streamed, course set for up the coast, with a smooth sea and all running sweetly.

Captain Nels E. Larson, of the Union Oil Company's tanker Coalinga

Down below the engines were turning over with a steady rhythm. Only five of the six boilers were in service, as the Coalinga is an "easy steamer." At 58 revolutions per minute and a development of around 3000 horsepower, she was pushing the big load through the water at a good 10-knot speed. A visit to the engine department showed that care, ability, and pride had blended to make what is known as a good running job. It was also most noticeable that the men on watch were individually interested in having things shipshape and Bristol fashion. Platforms were clean; handrails were polished; boiler fronts neat; all auxiliaries ran quietly; and an air of harmony and solid efficiency was most noticeable. It was good to roam around the engine room and listen to the old familiar sounds and inhale the pungent odor of steam warmth and oil; to hear the softly purring dynamos, whose steady hum was broken by the click of check valve and "ker-plug" of feed pump. The gently oscillating needles of the steam gauges showed close regulation of pressures, while the columns of water in the gauge glasses slid up and down in a smooth steadiness indicating dry steam and no forcing. The condition of the store and tool rooms was proof of a contented crew. Tidiness and order were evidently the keynote of service. Spare gears were neatly arranged on bulkheads and stores placed so as to stay put but easily accessible. Chief John F. Joki is evidently "on to his job."

Up on deck also the men were making the ship orderly. Of course just leaving the dock it would have looked to a landlubber as if confusion reigned. But the old mariner saw at once that everything was being put as it should be. Tangled lines and zig-zag gear disappeared as if by magic. In their places were neat coils of rope and geometrically aligned booms. The lines of big oil hose were laid snug along the deck, ready to be used in a few hours more to discharge the cargo again at Oleum. For quick loading and discharging is the rule on tankers. Like most ships they pay dividends only when under way. To the mate, O. E. Solvin, is due much credit for the sailor-like manner in which his department is handled. The larger companies have evidently made a study of conditions as they now exist, and by scientific methods have shown that consideration of the personnel brings better results. Every member of the crew on the Coalinga appears to consider himself a part of the employing company. There is reward for efficient and steady service. Promotion is sure if the

Left, First Mate Apse on Union Oil tanker Warwick. Right, Boatswain Rasmussen of the tanker Warwick; Ed. B. Moore, chief steward on the Coalinga; and Manual Deniz, fireman on the Coalinga.

employe does his part. Living conditions are made as comfortable as possible, and steady work is certain.

One of the principal factors in making a ship's crew contented is good food and its proper preparation. Best food is insisted on by the directorate of the Union Oil Company. A port steward in the person of H. E. Kemp attends to the selection and purchase of all commissary stores. His experience in this line is wide and he has the faculty of picking the right men to prepare this good food in a palatable manner; for without able cooks and stewards the best of grub will not appeal to even the ravenous appetite of an outdoor worker. To keep the food in good condition, tankers are equipped with clean, well ventilated storerooms with ample refrigeration capacity. The big galleys are fitted with ovens, steam cookers, and broilers. The Coalinga's commissary department was presided over by Ed. B. Mohr, whose life work has been devoted to catering, except for two strenuous years he put in "over there," where he was in the brunt of activities. His younger days were spent in the Ritz, Hotel Powers, and with the New York Central Railroad, where he was employed as traveling chef. Mohr is more than a cook—he is an artist in viands. Seamen usually compare the cook of the last ship with all others, always to the detriment of the present "doctor," but from what was observed, the Coalinga crew opined that they had the best cook ever.

Marine matters as a whole for the Union Oil Company are handled by A. O. Pegg, with offices in the company's building at Los Angeles. He is ably assisted by Port Captain H. Halvorsen and Port Engineer George MacLean, with H. E. Kemp as port steward. These gentlemen contact with the executive personnel of the tankers, seeing that the policies of the management are carried out.

Captain Nels E. Larson of the Coalinga has been with the Union Oil Company for some seventeen years, joining as a seaman. To attend to the many duties devolving on the shipmaster requires application and personality. Besides the responsibility of safe navigation, he must act as the representative of the ship when in foreign ports. He is also an accountant and cashier, for wage payments and labor items are kept by him on these vessels instead of by a purser as in passenger steamers. He must see to it that his command is kept up to the high standard set by the company as regards physical condition. He must watch the operations of mooring and docking, and so plan that delays do not occur. And in addition to these qualifications he must also be a man able to enlist the respect and hearty cooperation of all the ship's company.

Captain Shiele on the bridge of the tanker Warwick

There are many employes of the company who have not aspired to high rank but through the years have faithfully served and who are listed at the head office as special assets. One of these is Manuel Deniz, a native of sunny Portugal, who for twenty-one years has worked steadily for the Union Oil Company as a fireman and is still an active member of the Coalinga's crew. He remembers when a vessel that would carry ten thousand barrels of oil was considered too large, and he also knows how conditions and living have changed for the better in the business. Manuel, with true thrift, has laid by a handful of dollars. Though never having advanced above the rate of fireman he is a good one and will probably for many years to come watch pressure gauges and see that oil burners run clear and clean.

Mate O. E. Solvin and Chief Engineer John F. Joki of the tanker Coalinga.

The trip on the Coalinga ended at Oleum, where the work of discharging began a few minutes after docking. Then she took on another cargo for the Panama Canal, and left for a longer voyage. This is the rule with all the larger tankers. They shuttle and go from the Occident to the Orient; from Bombay to Buenos Aires; from Australia to Alaska; and to all sorts of out of the way places carrying the liquid wealth of California. It is a busy life, but has its attractions, though to a family man there are drawbacks. However, the job is sure and the compensation steady with always the opportunity of advancement.

The refined products of petroleum range from the very liquid distillates, like naphtha, gasoline, and kerosene, to the somewhat viscid lubricating oils and heavier and semi-solid greases. To transport these in quantities economically, specially designed and arranged vessels have been built. One of these, the Warwick, of the Union Oil Company, was just ready to leave Oleum as the writer arrived on the Coalinga; so a quick transfer to the Warwick was made. She was just completing the loading of kerosene and lubricating oil. She had brought up from the south on her former trip a load of gasoline. Her port stay is even shorter than that of the large tankers, as it is possible to pump several different kinds of cargo from her tanks at one time, and perhaps a heavy cylinder oil, a light gasoline, a medium lubricating oil, and a stream of kerosene may be passing through the lines, all handled by specially designed pumps, while at the same time case goods stored in the wing holds are hoisted out by winches.

The Warwick is a comparatively new vessel, laid down by the Shipping Board for war service, and completed in 1921. She is driven by a Westinghouse turbine of around 1800 horsepower. Her accommodations for officers and crew are even more comfortable than those on the Coalinga. On account of the very inflammable nature of her cargoes, special arrangements have been made to prevent entry of volatile gases into state rooms, living rooms, and galleys. When she is taking on gasoline or naphtha, all

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fires in boiler rooms are extinguished, and the crew takes a stroll ashore, eliminating to the last degree any chance for fire or explosion. As some of her cargoes are mostly of naphtha, used extensively in the northern canneries for a base in the lacquers applied to tin cans, all this caution is advisable, for naphtha is about as quick and treacherous as high tension nitroglycerine.

But the members of the crew do not mind this any, as they know every possible device protects them, and accidents are infrequent. The Warwick being only about 4469 gross tons and especially fitted as she is, plys on the coast only, making her a desirable job. Her people all seemed to have the same characteristic as regards service and were a most contented bunch. A better running and neater job would be hard to find. From Captain Sheile down to the mess boy, everyone appeared desirous of doing things in the right way. Thirty-six hours after leaving Oleum, the Warwick arrived at Los Angeles Harbor, was docked, and her assorted cargo was being discharged. She at once commenced to load naphtha for British Columbia and would be away in a few hours. Her commissary, as on the Coalinga, was of the best.

Puget Sound Trade

A TRAINLOAD of tin plate from the east, destined for Japan, has been routed over Seattle docks, instead of being shipped via Atlantic Coast or Gulf of Mexico ports for steamer shipment direct through the canal and across the Pacific. The shipment, a record one, is coming from the American Sheet and Tin Plate Company, Gary, Indiana.

Tourist travel to Alaska will break all records this summer, and the steamer lines operating between Seattle and the northern territory are going to have fourteen more vessels on the route than ever before. Tourist travel to Alaska has tripled in the last five years. The Alaska Steamship Company has purchased another vessel which is being outfitted with de luxe accommodations for the southwestern Alaska run. It has been christened the Aleutian and is a sister ship to the Yukon. The Alaska railroad, the 560-mile road owned by the government and connecting Seward and the seaboard with Fairbanks and the interior of Alaska, showed increased earnings of 24 per cent between July 1 and January 1, 1926, in comparison with the same period of 1925.

The most significant industrial development in the Pacific Northwest in more than a decade is the expansion of the paper and pulp industry. In the last year approximately $18,000,000 has been invested or authorized for investment in expansion of the paper and pulp industry in western Washington, and it is known that several large eastern pulp and paper companies are investigating sites with a view for large investments.

The government is opening bids this spring for the sale of two immense tracts of timber in Alaska, with stipulation that each tract will call for an investment of $10,000,000 in a pulp and paper plant, and it is understood that there will be tenders offered in accordance with the government's requirements. In view of the tremendous stands of virgin pulp wood, cheap and adequate water power, and year around production in Alaska, the effect of the government's new policy may be revolutionary in respect to the production of paper in Canada and other competitive areas.

Water-borne commerce from Puget Sound to New York has placed the Pacific Coast within 769 miles of New York. Neenah, Wisconsin, is one of the greatest paper producing centers of the Great Lake states, and it is 1100 miles from New York, yet the freight rate from Seattle to New York is a little over half of that from Neenah, Wisconsin, to New York.

Pulp mills on Puget Sound this year shipped their raw pulp to Neenah, Wisconsin, and to a point in Indiana, where it was manufactured and sold throughout the east at a profit. This same pulp could have been put into paper on Puget Sound and shipped to Chicago, Toledo, and Detroit for 65 per cent of the cost to get the pulp back there. The entire output of one of the biggest paper mills on Puget Sound was sold last year in St. Louis.

Stumpage for pulp making material on the Pacific Coast is about one-fourth the amount charged either in the Lake states or New England states.

Captain Ivan L. Peterson.

From Gold to Oil

OLD timers on the San Francisco waterfront will remember the S.S. Florence expedition to Alaska under Captain Ivan L. Peterson in the "gold rush" days.

On April 19, 1898, the sternwheel steamer Florence, rigged up as a sailing schooner, left San Francisco via the outside passage for St. Michael, Alaska. The schooner was 92 feet long, 22 feet beam, and 5 feet depth of side. The vessel was loaded down with machinery and other freight to a draft which left only 12 inches of freeboard. The trip was extremely rough and to cover the 4600 miles took 60 days. At St. Michaels the vessel was converted into a sternwheel steamer and went up the Yukon River and then up the Koyukuk close to Bettles above the Arctic Circle, where she got stuck on a bar and was frozen in for about seven months. No good gold prospects were found and the captain returned to St. Michael where the steamer was sold to the Alaska Commercial Company. The captain went to Nome where he located several good claims for one of the big companies.

Captain Peterson is very enthusiastic about the future of this great territory of Alaska and is again seeking his fortune there. This time he is located in the beautiful Chickaloon territory, where scenery and climate are ideal and where he has discovered oil indications that are most promising. He now has a large and complete drilling plant in operation and is being backed by some of the most influential business men in the west.

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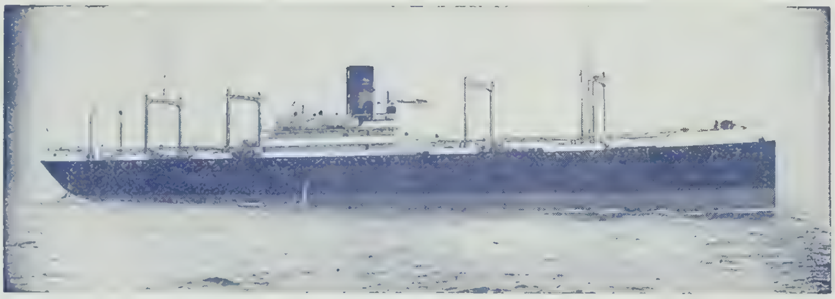

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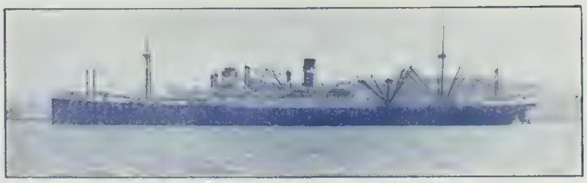

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American Shipbuilding

(Continued from Page 246)

Cruiser Contract Awards, Continued

could bid on all six sets of the propelling machinery, each set of which is to consist of four complete units of turbines and gears with spare parts and turbine gear control apparatus. Two firms submitted bids on the machinery.

The bids were:

Newport News Shipbuilding and Drydock Company: Vessels to be livered to the government at the Navy Yard at Norfolk, Va.

Bid under class one: One vessel in 36 months, $10,642,000; two vessels in 36 and 45 months, $10,480,000 each.

Bid under class two: One vessel in 36 months, $10,142,000; two vessels in 36 and 45 months, $9,995,000 each.

Bethlehem Shipbuilding Corporation: Vessels to be delivered to the government at the Navy Yard at Boston, Mass.

Class 1: One vessel in 36 months, $10,675,000; two vessels in 36 and 45 months, $10,540,000 each.

Class 2: One vessel in 36 months, $10,375,000; two vessels in 36 to 45 months, $10,265,000.

The American Brown-Boveri Electric Corporation: Vessels to be delivered to the Government at the Navy Yard at Philadelphia.

Class 1: One vessel in 36 months, $10,815,000; two vessels in 36 and 45 months, $10,708,000.

Class 2: One vessel in 36 months, $10,350,000; two vessels in 36 and 45 months, $20,243,000.

Quotations on Machinery

In case the Navy Department decides to contract for the propelling machinery separately, and have it installed by the shipbuilder, bids were called for six sets of main turbines and gears, each set to consist of four units. The General Electric Co. and the Westinghouse Electric & Mfg. Co. were the sole bidders. The General Electric Co. bids are as follows:

No.	Time	Cost per set
1	16 months	$690,000
2	16, 18 months	660,000
3	16, 18, 20 months	630,000
4	16, 18, 20, 24 months	605,000
5	16, 18, 20, 24, 26 mos.	595,000
6	16, 18, 20, 24, 26, 29	585,000

The bids of the Westinghouse Electric & Mfg. Co. are as follows:

Total Cost

1 18 months, $821,000, $872,000, $886,000.
2 18, 20 months, $1,442,000, $1,552,000, $1,523,000.
3 18, 20, 22, months, $2,110,000, $2,265,000, $2,220,000.
4 18, 20, 22, 28 months, $2,756,000, $2,934,000, $2,875,000
5 18, 20, 22, 28, 30 months, $3,349,000, $3,589,000, $3,517,000
6 18, 20, 22, 28, 30, 32 months, $3,950,000, $4,251,000, $4,145,000

Note: Three bids on each set were submitted by this bidder due to the fact that he submitted three alternate proposals of installation.

Several alternate bids in minor matters of design and installation were submitted for the consideration of the government.

Higher bids were alternately submitted when the factor of higher steam pressure and super-heated steam were considered. Additional sums were also noted in the case of west coast delivery of the machinery in case the government decided to accept the estimates of some of the several navy yards who have submitted estimates on the construction of these vessels.

It was at first announced by the Navy Department that the Navy Yard estimates would not be opened with the other bids. They were opened later in the day, however, and the low figures submitted by the navy yards became public. While the bids are more or less complicated by alternatives, the basic estimates show that Mare Island submitted a low bid of $7,116,785 to build a single cruiser and $6,642,440 for two cruisers. The Bremerton Navy Yard figured one cruiser for $8,395,000 or two at the rate of $8,045,000 each.

At present only a portion of the funds necessary to complete the vessels has been appropriated, in the case of the light cruisers 29, 30 and 31 only $450,000 having been set aside at the last session of Congress.

Speedy Repairs at Morse Yard

NOT long ago, in New York Harbor, the steamship Sac City and the steamship El Sol were in collision. The El Sol sank and the Sac City, with serious bow damage, went to the Upper Yard of the Morse Dry Dock & Repair Co., foot of Prospect Avenue, Brooklyn, N.Y.

Here it was found necessary to put in an entire new stem, fourteen new shell plates, five new frames, and remove, fair, and replace five shell plates. It was estimated that eight continuous working days would be necessary to accomplish the work.

However, skilled workmen and expert supervision, combined with a plant adequately equipped to handle such emergency repairs, completed the job in the record time of six days.

WESTINGHOUSE AWARDED COAST GUARD CUTTER CONTRACT

The contract for turbo-electric propulsion units of the first three of a total of ten United States Coast Guard cutters, authorized by Congress last year, was recently awarded to the Westinghouse Electric & Manufacturing Company. These vessels are intended for general use in the Coast Guard, including ice patrol service in the North Atlantic, and will probably be put in commission in the spring of 1928. The design and construction of these cutters will be under the direction of Captain Q. B. Newman.

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THE British steamer Westmoor is reported fixed from Columbia River to U.K./Continent, with grain, Apr./May loading,36/9, Balfour Guthrie & Co., and the British steamer Sedgepool from the North Pacific to U.K./Continent, wheat, April/May loading.

The following steamers are reported fixed with lumber from the North Pacific to Australia: American bktn. Centennial, J. J. Moore & Co.; American bktn. Monitor, Sydney, Mar./Apr., same charterers; American sch. Fort Laramie, same; American schr. Moshulu, Sydney and Melbourne, same; American schr. Chillicothe, Melbourne (owners' account) same; American schr. Monongahela, July, same charterers; American schr. North Bend, July, Balfour Guthrie & Co.; American schr. Thistle, June, J. J. Moore & Co.; Danish m.s. Nordbo, San Francisco, Eureka, and Grays Harbor to Melbourne, American Trading Co.

The following fixtures are reported for lumber to the Orient: Japanese str. Clyde Maru, North Pacific to Japan, Apr., Pacific Export Lumber Co.; Japanese stmr. (Suzuki), North Pacific to one port Japan, $12, Apr., National Trading & Lumber Co.; Japanese stmr. Choyo Maru, Columbia River to Japan, Apr., Douglas Fir Exploitation & Export Co.; Japanese stmr. (Yamashita), Vancouver to two ports Japan, $4.75, June, Mitsubishi Co.

The American stmr. Point Loma is reported fixed with lumber from North Pacific to Callao, Mar./Apr. loading, W. R. Grace & Co.

The Norwegian stmr. Dicto is reported fixed with lumber from the North Pacific to North of Hatteras, one trip, and the American stmr. J. R. Gordon from Grays Harbor to North of Hatteras, May loading, Hirsch Lumber Co.

The British stmr. Benroch is reported fixed with lumber and merchandise from British Columbia to U.K./Continent, lump sum, Canadian American Shipping Co.

The American bktn. Conqueror is reported fixed with lumber from Puget Sound to South Africa, Mar./Apr. loading, by J. J. Moore & Co., and the British m.s. King Malcolm from San Francisco and North Pacific to South Africa, May loading, lumber and merchandise, same charterers.

The Norwegian stmr. Kalfarli is reported fixed from the North Pacific to three ports Japan, wheat and lumber, lump sum, Apr., by W. L. Comyn & Co., and the American stmr. Edna Christenson, from the North Pacific and San Francisco to Buenaventura, lumber and merchandise, May loading, by Darling Singer Lumber Co.

The following steamers are reported taken on time charter: British stmr. Skegness, delivery Japan, redelivery Australia via North Pacific, W. L. Comyn & Co.; British stmr. Welsh City, 9 months, delivery Los Angeles (Apr./May), redelivery Australia, $1.40, American Trading Co.; British stmr. Sheaf Mead, 10 months, Pacific trade, delivery Japan, May, redelivery Australia, $1.20, American Trading Co.; British m.s. Cape of Good Hope, Pacific trade, delivery Cuba, Apr., Canadian Transport Co.; British stmr. York City, Pacific trade, delivery and redelivery Japan, 5/6, May, H. R. MacMillan Export Co.; Italian m.s. Ansaldo San Giorgio Terzo, 6 months, delivery and redelivery North of Hatteras, via British Columbia, $1.35, H. R. MacMillan Export Co.; Danish m.s. Nordpol, 6 months, Pacific trade, delivery and redelivery North of Hatteras, $1.50, Canadian Transport Co.; Norwegian stmr. Capto, 9/12 months, Pacific trade, delivery and redelivery U.K./Continent, Apr., 4/3; Japanese stmr. Yomei Maru, 12 months, Pacific trade, delivery Japan, May, Yen 1.80, Yamashita Co.; Japanese stmr. Yoneyama Maru, 6 months, Pacific trade, delivery Japan, June, Yen 2, Yamashita Co.; Norwegian m.s. Neptunian, Pacific trade, $1.45, delivery Colon, May, H. R. MacMillan Export Co.

The following sales have been reported: American stmrs. Mary Weems and Esther Weems, Baltimore and Caroline S. S. Co. to Pacific S.S. Co.; American schr. Melrose, Coast Shipping Co. to P. Medica of Los Angeles; American stmr. Alvarado, Sudden & Heitman Lumber Co. to Moore Mill & Lumber Co.; American bktn. Anne Comyn, W. L. Comyn & Co. to Seattle parties

PAGE BROTHERS, Brokers.

Chesapeake and Potomac Ports

Port Series Report No. 16, issued by the Board of Engineers for Rivers and Harbors of the War Department, in cooperation with the United States Shipping Board. This is a report on the ports of Baltimore, Md., Washington, D.C., and Alexandria, Va., constituting No. 16 of a series of reports on the ports of the United States.

Information contained in the report shows that Baltimore is an important receiving and shipping port for bulk commodities. Large quantities of grain, flour, coal, iron and steel products, and copper are exported; and petroleum products, iron ore, sugar, molasses, and fertilizer materials are imported for local consumption and shipment to the interior. In the intercoastal traffic with the Pacific Coast the port occupies an extremely important position on account of its nearness to eastern iron and steel centers. A rich agricultural section and the waters of the Chesapeake Bay supply a great variety of food products for its purely internal trade.

Alexandria, situated on the Potomac River, formerly occupied an important position among ports of the United States. The demands of local industries and of the adjacent territory are not sufficient, however, to support a large traffic as measured by present standards. The principal receipts are sand and gravel, phosphate rock, and pulpwood, and the principal shipments are coal and general merchandise.

Washington, the capital of the Nation, is situated on the left bank of the Potomac River at its confluence with the Anacostia River. The principal receipts are sand and gravel and petroleum products, while the principal shipments are sand and coal. Practically all of the water traffic, averaging over 1,000,000 tons annually, is directly related to local and governmental needs.

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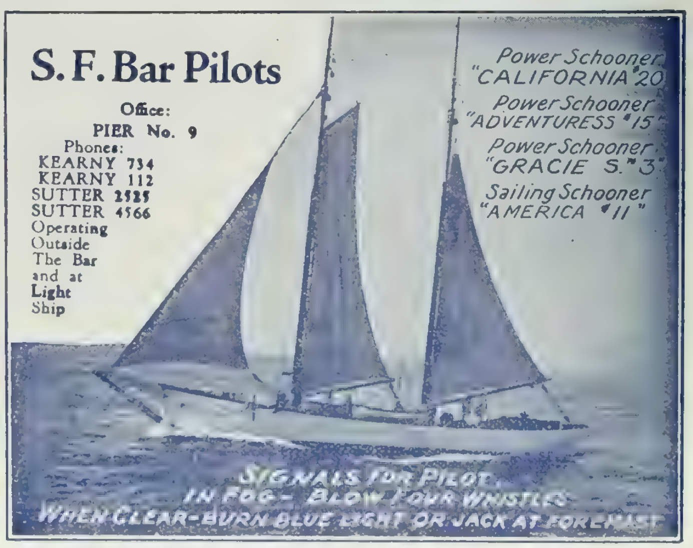

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SIGNALS FOR PILOT.
IN FOG — BLOW FOUR WHISTLES
WHEN CLEAR — BURN BLUE LIGHT OR JACK AT FOREMAST

Who's Who afloat and ashore

Edited by Jerry Scanlon

ULYSSES Grant Rowley, who has sailed under the house flag of the old Pacific Mail and the Panama Mail Steamship Company continuously for forty-three years, and who has been chief engineer aboard the liner Ecuador for the past three years, is shoreside on leave. Chief Engineer Rowley will rejoin one of the vessels of the fleet, when the call of the sea again urges him from his retreat in Alameda, his home.

Chief Rowley joined the old Pacific Mail forty-three years ago as an oiler, and he was assigned to the steamer City of New York by Sam Hawxhurst, at that time superintendent for the company. Among the vessels that the veteran engineer has sailed during his forty-three years of maritime service were the steamers Colima, San Juan, Costa Rica, Colon, City of Para, Aztec, City of Sydney, and Ecuador.

"One must tend the soil in the spring, even if he is a sea-going person," stated the genial engineer as he was discovered busily engaged in tending his garden in Alameda.

Tokyo advices to the San Francisco offices of the Nippon Yusen Kaisha stated that Shusuke Sakomidzu, connected with the head office in Japan in the passenger department, is due to arrive at San Francisco within a few days en route to Los Angeles, to become identified with the offices there. He will work under Y. Kimura, resident manager in Los Angeles, according to Takeo Yammoto, N.Y.K. Line manager in San Francisco.

The end of June will witness the establishment of a Central American-Pacific Coast service by the United Fruit Company Line, with the vessels flying the house flag of the Fruit Dispatch Line, a subsidiary of the powerful great "White Fleet" which operates 101 vessels.

Louis M. Porter, general traffic manager of the Dispatch Fruit Line, made the announcement following a lengthy inspection tour of port facilities on the Pacific Coast, in company with Harvey M. Huff, Pacific Coast agent for the United Fruit Company. Mr. Porter stated that his company is primarily interested in the development of the banana trade between Latin America and the Pacific Coast, but also stated that a passenger service will be inaugurated. The ships that will inaugurate the service will each have a carrying capacity of 50,000 bunches of bananas.

Chief Engineer Ulysses Grant Rowley, of the Panama Mail Line.

Louis M. Porter, general traffic manager of the Dispatch Fruit Line of the United Fruit Company.

Ten months ago, first intimations were given that the United Fruit interests were making observations on the Pacific Coast, with the visit of V. M. Cutter, President. Reports in general circulation state that eventually a regular passenger and freight service will be maintained by the Fruit Dispatch Line between New York and Pacific Coast ports.

Pacific Coast shipping interests are awaiting receipt of specifications and details of the new 25,000-ton passenger motor liner that the White Star Line has contracted to be built by the Harland & Wolff Shipyards in Belfast. The vessel will be the largest motor-driven passenger liner in the world.

Following the return of Harry S. Scott, president of the General Steamship Corporation, from the Pacific Northwest, he announced that several shifts were made in the Portland and Seattle offices.

Willis Kemp was changed from the Seattle to the Portland office in the chartering department, changing with H. A. Jeans. W. G. Kerr, who was in the chartering department's San Francisco office, was also sent to the Seattle office.

Advices from Los Angeles stated that officers aboard the Johnson Line motorship Axel Johnson revealed that the company was planning the construction of three fast combination passenger and freight motorships. The first vessel, for which the keel will be laid in Swedish yards, will be a sister ship of the Axel Johnson, while the remaining two will be of larger dimensions with accommodations for 150 passengers. The trio of new motor-driven carriers will be inducted to the Pacific Coast-European service of the Johnson Line, the report stated.

From Seattle to San Diego, employes and executives of the McCormick Steamship Line, are wearing service emblems. The emblems are in appreciation of the time spent in the company's service and were presented by Charles R. McCormick, president. The emblems

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are of neat design in the form of a five-pointed star with the letter "M" in the center. The badges are presented to those who have been from five years up in the company's service.

San Jose, California, has taken initial steps to secure a deep water harbor. Meetings are now being held to work out details for the maritime project, which, it is estimated, will cost in the neighborhood of $2,000,000.

Sponsoring the project is Captain L. M. Cox, harbor engineer, and well known in Pacific Coast maritime circles. The tentative plan would call for a turning basin at Alviso, which is seven miles from San Jose and at the southern extremity of San Francisco Bay. Congressman Arthur M. Free said that if the government approves of the project, Congress would appropriate 50 per cent of the money needed for dredging, or $1,000,000. It was pointed out that at present approximately 200,000 tons of freight destined for water-borne destination is shipped from the Santa Clara Valley annually.

"It certainly feels good to be on the bridge of a vessel as she enters the Golden Gate, but the growth of the city, vividly portrayed as I aproached San Francisco Bay, was amazing." These were the words of Captain M. M. Jensen, commander of the Dollar Liner President Grant, when he reached port on his first visit to San Francisco in many years.

Old time shipmates, now located in San Francisco, were constant visitors to the President Grant renewing friendships. Other well-known officers on the President Grant are William H. Gates, chief engineer; George Van Haute, chief officer; Myron Holzer, purser.

An extensive survey of the new liner Malolo, now nearing completion at the Cramp shipyards, Philadelphia, has been made by William P. Roth, vice-president and general manager of the Matson Navigation Company, and the "Flying Fish" is meeting the expectations of her owners and builders in every way, according to Mr. Roth.

The vessel will be ready to start service out of San Francisco in July, and she will negotiate the 2200 odd miles to Honolulu in four and one-half days. The principal dimensions of the Malolo are 582 feet in length; width, 83 feet. The vessel will make 25 miles an hour on her schedule. Commanding the vessel on her trip to San Francisco from the East Coast will be Commodore Peter Johnson of the Matson Fleet, who started with the late Captain William Matson as quartermaster in the era of the sailing ships.

Myron (Jeff) Holzer, purser on the American Mail Liner President Grant.

A plan is under way by the federal and provincial governments of Germany to subsidize German shipbuilders to the extent of 22,500,000 marks, Berlin advices state. Allotments are to be made to the fund to permit shipowners to meet interest on loans for the construction of new tonnage. The forthcoming assistance is reported to have resulted in a stimulus in the shipbuilding and general shipping conditions throughout Germany.

News of the death in Seattle of Henry Dearborn, vice-president of the American-Hawaiian Steamship Company, was received with a shock by hundreds of shipping and business friends from the Atlantic to the Pacific Coast. Mr. Dearborn passed away early last month, after a short illness.

The name of Dearborn has long been identified with American maritime activities. His father, the late George S. Dearborn, founded and was the first president of the American-Hawaiian Steamship Company.

Following his graduation from college, Henry Dearborn entered the New York offices of the company. When the American-Hawaiian and the United American Lines entered into a working agreement, he was elected president, and continued in this position until 1923, when he resigned. Since that time he had been located in Seattle with the title of vice-president. He is survived by his widow and two sons.

Two Pacific Coast skippers and two chief engineers are now enroute to this coast aboard two vessels that the Admiral Line purchased on the East Coast. Captain Harry Halverson is skipper of the Mary Weems, while Percy Jordan is chief engineer on the same steamer. The other vessel, the Esther Weems, is commanded by Captain Harry Greis and John Kane is Chief Engineer.

Captain Halvorsen is alternate master of the liner H. F. Alexander, while Chief Engineer Jordan has been on the Admiral Dewey. Captain Greis was skipper of the Admiral Dewey and Chief Engineer Kane was in charge of the engine room on the Admiral Fiske. The vessels will augment the Pacific Coast service of the Admiral Line. Both craft will be renamed before entering regular service in the middle of this month, according to President H. F. Alexander.

East Coast shipping conditions are good, was the optimistic report of Fred Doelker, assistant general manager of W. R. Grace Company, who is back home from New York, where he went to greet General Axel Johnson, head of the steamship service that bears his name. General Johnson was expected to visit the Pacific Coast terminals of the company, but was forced to return to Sweden on account of urgent business, without leaving New York.

Walter Pringle returned as chief officer aboard the Panama Mail liner Venezuela after a two months' vacation. Clinton Baverstock, who relieved him, is shoreside awaiting orders. Frank Malloy, nephew of E. T. Ford, president of the Panama Mail Line, is learning the steamship business. He is now assistant freight clerk aboard the liner Ecuador. He made several trips in the same capacity on the steamer Venezuela.

Jake Reznick, formerly chief officer on the Panama Mail liner Colombia, is now second officer on the W. R. Grace freighter Cacique, of which Captain Lindholm is skipper.

Merle Johnson, who remained shoreside for several voyages, is now chief engineer aboard the steamer Ecuador. He relieved Chief Engineer Ulysses Grant Rowley. "Feels good to hear the engines turning over again," stated the genial chief just before sailing time.

Salvage claims against the Japanese steamer Ginyo Maru, which when operated by the Toyo Kisen Kaisha, caught fire off Central America in 1924 and was taken in tow by the Panama Mail liner City of San Francisco, were awarded the claimants, to the extent of $25,000. Passengers were taken aboard from the burning Japanese liner by the City of San Francisco and the craft was then towed into Manzanillo. Participating in the salvage awards were Captain Curt Zastrow, now master of the liner Ecuador, who was skipper of the City of San Francisco, and Ned Lorenzen, purser of the Ecuador, who was also on the rescue ship.

Stockton business men have been surveying various ports of the Pacific Coast and other maritime harbors of the United States for the purpose of securing data for proposed development of Stockton's harbor, which, it is estimated, will eventually cover an expenditure of $6,000,000.

The ranks of California shipmasters will be increased in the near future. Captain H. A. T. Candy, senior officer of the Panama-Pacific Line, confided to friends that he plans to establish his home somewhere in California. Captain Candy is master of the liner Mongolia. He has sailed to all parts of the world, but has decided that California is the finest place to make one's home. Also the ranks of the golfers will be swelled, as the genial skipper is an ardent addict of the ancient Scotch game.

Herbert N. Thomas is due to arrive home early this month after a five weeks absence in Honolulu, where he went to inspect offices of the Oceanic Steamship Company, for which he is general passenger traffic manager.

When the Dollar liner President Grant arrived in San Francisco a large delegation of men who follow the sea were on hand to greet Myron "Jeff" Holzer, one of the best known pursers sailing in the transpacific trade. This was Mr. Holzer's first visit to San Francisco in more than five years. He was at one time purser on coastwise liners of the Admiral Line.

If Charles M. Schwab, head of the Bethlehem Steel Corporation, thought he was going to "slip one over" on his old friend Joseph J. Tynan, vice-president and general manager of the Bethlehem Shipbuilding Corporation, by arriving in San Francisco unheralded, he missed his guess.

Mr. Schwab arrived in his special car attached to one of the transcontinental flyers. However, Mr. Tynan had been advised from the East that Mr. Schwab was enroute to San Francisco. When the Schwab special arrived on the east side of the Bay, Mr. Tynan, with fifty of the leading shipbuilding, ship operators, and business men of San Francisco and the bay cities were on hand to greet Mr. Schwab. A fast motor launch was in readiness, and the distinguished arrival was escorted on an impromptu inspection tour of San Francisco Bay shipyards. During the short time he was in San Francisco he was entertained by Mr. Tynan and other leaders of the maritime and civic life of San Francisco and Oakland.

Captain H. A. T. Candy, Panama Pacific Liner Mongolia, ranking officer of the fleet

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Following the death of Henry Dearborn in Seattle last month, H. A. Shook has been named as acting Seattle agent for the American-Hawaiian Steamship Company, for which Mr. Dearborn was vice-president, up to the time of his passing.

New York advices received in engineering circles state that the Ocean Association of Marine Engineers have been advised to the effect that the Shipping Board has granted an increase in wages on motorships of $25 for chief engineers, $10 to first and second engineers, and $5 to third engineers. Captains on these vessels also received a salary increase of $10, the report added.

The basketball quintet of the Luckenbach Steamship Company, San Francisco, was declared the basketball champions of the Pacific Coast Steamship World by defeating the Los Angeles Steamship Company's team in a game played at San Francisco. The visitors were outclassed despite a large delegation of steamship men who accompanied the southern delegation as rooters.

J. H. Todd, assistant general freight agent of the Luckenbach Line, managed the team during their triumphant season. The members of the steamship world on the Pacific Coast play no small part in the field of sports, and each year sees the development of fine baseball, basketball, swimming, and bowling teams.

Byron Paine, formerly chief officer of the liner Mongolia, resigned to join the Panama Canal Pilots.

Captain C. A. Berndston will be executive officer of the new Matson liner Malolo. He was relieved as commander of the Wilhelmina by Captain E. H. Sandelin.

A. J. Wappett, superintendent engineer for the Furness interests in New York, returned home, after an inspection of the Company's terminals on the Pacific Coast.

When Thomas H. Harper, who recently retired after fifty years of service as marine surveyor for Thames and Mersey, Liverpool, arrived in San Francisco on a tour of the world, he was the guest of Louis Rosenthal, general agent for the company in San Francisco.

Word from New York reported that due to illness, Francis J. Matthewson, first assistant engineer of the liner President Polk was forced to remain shoreside. His berth was filled by O. T. Nelson, second engineer, upon the recommendation of Chief Engineer John W. Ehle.

Pacific Marine Review

The National Magazine of Shipping

June, 1927

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S.S. City of Honolulu, heading out to sea from Los Angeles Harbor for engine trials and compass adjustments, May 14, 1927.

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PACIFIC AMERICAN
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SHIPOWNERS' ASSOCIATION
OF THE PACIFIC COAST

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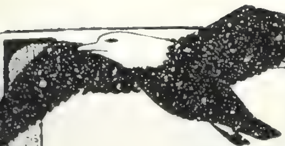


Pacific Marine Review

CONTENTS

June, 1927

Frontispiece 7

Editorials 253

Dead Reckoning; China's Open Door; Ocean Freight Rates; Largest Wooden Ships Ever Built; Placing the College Graduate; A Free Engineering Education.

Longshoremen's Compensation Law, by Warren H. Pillsbury 256

Inland Waterways Development, by Norman F. Titus 257

An old problem enters into a new phase which gives great promise of success.

The On-Coming Wave of Foreign Combination, by C. C. Martin 258

Passenger Liner City of Los Angeles 260

Los Angeles Steamship Company builds modern first-class floating hotel for Los Angeles-Honolulu service.

The New Nelseco Diesel Engine 270

Mechanical injection diesel-electric power plants great success in New York harbor tugs and New York-Weehauken ferryboats.

Interesting Design of 65-Foot Steel Tug for Geared Diesel Drive, by Renwick Z. Dickie 272

Pacific Workboats and Their Power Plants:

- Delta Boatyard Notes 274
- Bay Boatyard Notes 275
- Fishermen to the Rescue 276
- Bolinders 276

Fuel Conservation Honor Roll 277

Auxiliaries, Ship Supplies, Marine Equipment:

- The Pacific Plug 278
- Efficient Aid to Navigation 279
- Engine Indicators 280
- Pioneer Separator 280
- How to Splice Wire Rope 281
- Makes Welds Under Water 281
- Sperry Equips Largest Motor Yacht 282
- New Float Switch 282
- A Radio Compass Reading Device for Ships 283
- Refractory Maintenance 284
- Briggs Bitumen 275
- Telephone Specialists 276
- Storage Batteries Afloat 285
- Key Graphite Paste 285

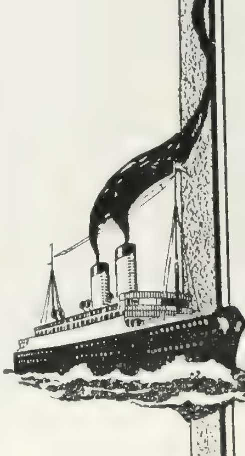
Honolulu's Largest Propeller 284

Marine Insurance 287

American Shipbuilding 293

Trade and Traffic Trends:

- Ship in American Ships .... 11 Adv. Section
- Who's Who Afloat and Ashore .... 17 Adv. Section
- Federal Banks and Foreign Trade, by J. A. H. Kerr .... 23 Adv. Section
- Freights, Charters, Sales .... 25 Adv. Section
- Merchant Fleet Organization .... 26 Adv. Section



Of a General Nature:

- Book Reviews 260
- Editorial Correspondence 260
- World Shipbuilding 271
- Trade Literature 285
- Trade Personals and Organization Notes 286
- Safety Equipment for Ships 292

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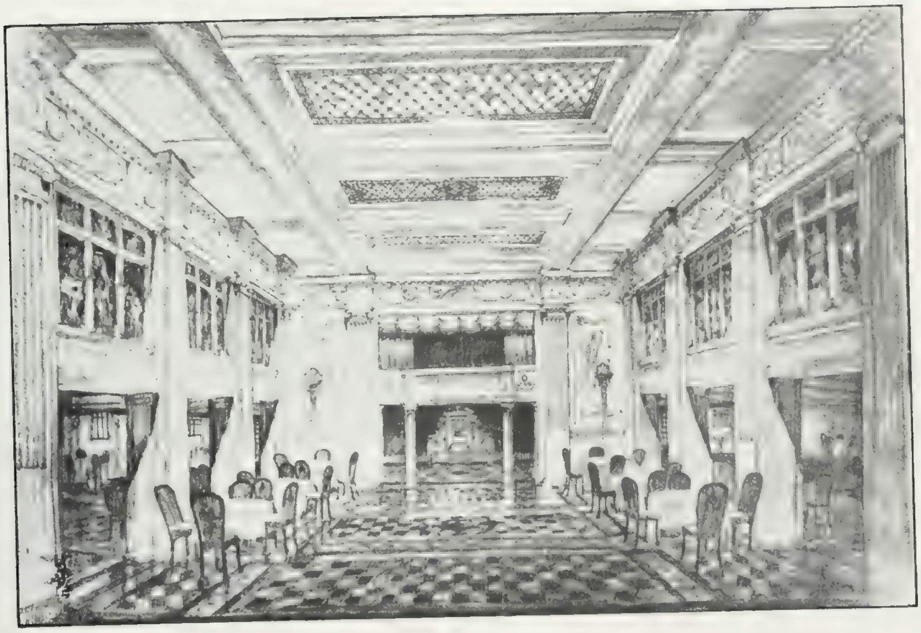

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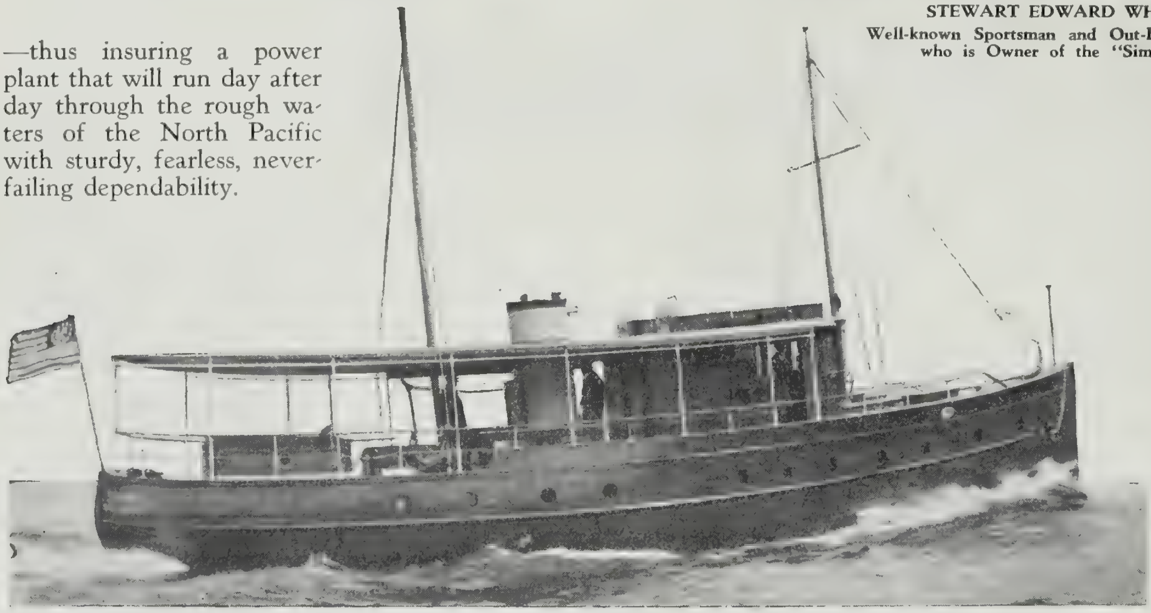

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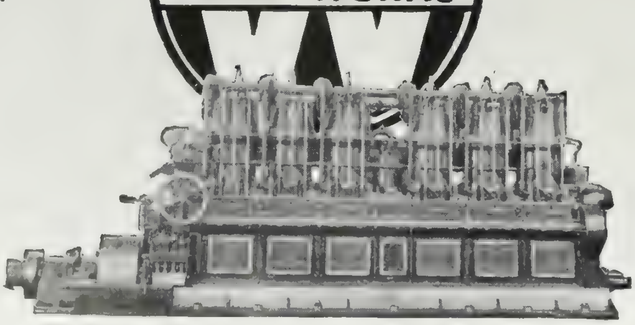

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Editor.

Paul Faulkner,
Advertising Manager

Ocean Freight Rates

THE following very terse summary of the trend of ocean freight rates is taken from "Review of the Pacific" for May, 1927. The concluding paragraph paints a picture that may cause certain entries in the shop operator's ledger to appear more rosy than red.

"The general trend of ocean freight rates has long been downward—for over a century at least. True, there have been upward swings in rates during this time—often as a result of tonnage perversion during wars, notably the Napoleonic wars, the American Civil War, the Boer-Spanish-American War period, and the World War.. Just preceding this last struggle rates had gradually reached a level of less than half of that of 1870. The following table of index numbers for ocean freight rates is adapted from a London 'Economist' table based on tramp tonnage rates for 28 routes on the Atlantic, Pacific, and Indian Oceans, the average of the period from 1898 to 1913 being taken for 100. The index numbers of the general world price level for the corresponding years are also included.

Index Numbers of Ocean Freight Rates
(Adapted from the London 'Economist')

Year	Ocean Ft. Rates	Gen. Price Level
1870	245	90
1880	232	76
1890	145	75
1900	135	76
1905	90	82
1910	70	96
1913	116	100
1920	510	213
1921	184	178
1922	142	170
1923	130	181
1924	129	181
1925	122	180

The obvious fact revealed by this chart is that ocean freights have declined more rapidly than prices in general.

Ocean freights for 1926 fell into three periods: the opening quarter of decline when the London 'Economist' figure ran down to 116, the Atlantic boom due to the British coal strike, and the post-strike period when Pacific shipowners expected a renewal of the decline. This, however, has been slow in returning. Obviously ship tonnage cannot be immediately pried loose from contracts and whisked half way round the globe over night. However a further decline in freight rates is generally anticipated by the better informed. The fairly rapid introduction of the more economical motorship now in process is enough of itself to guarantee that.

After all, they who build ships, they who sail them, and they who decade by decade cheapen the cost of carrying commodities to the ends of the earth are among the permanent benefactors of mankind and play a wonderful game. To take the whole grain crop of the Columbia River country, dump it into a vast iron tub and go racing with it down the treeless trackless Pacific at the rate of a galloping horse, guided only by a needle rubbed on a black rock; to head in exactly at the west portal of our half-billion dollar ditch at Panama and then go racing off again across another treeless, trackless 5000 miles to strike with equal accuracy the mouth of the Mersey, is to say the least, one of the marvels of the ages. And the fiddler's bill? A mere 33 cents a bushel, a half pound of butter!"

Dead Reckoning

BACK of all the popular fanfare of trumpets over the marvelous transatlantic flight of Captain Lindbergh, there stand out two features of his work that make him kin to all the great sea captains and ocean navigators of history. When the youthful American aviator landed in Paris, the famous British Ace, Cobham, greeted him with the question, "Did you come across on dead reckoning only?" "Yes," was the answer, "we made it on dead reckoning."

That "we" constantly used by Lindbergh, is the best indication that this pilot considers his ship a personality. She is making the flights with him and is a thing of life whom he can "lift by sheer will power" off the runway and whom he can steer and veer as if she were a part of himself. This feeling among yachtsmen, fishermen, sailormen, indicates the born navigator breed.

Add to this feeling the long years of hard training and of shrewd observation which were given by Lindbergh to his preparation, and the result is that sure "dead reckoning" which enables him to fly with even greater surety of direction than the best of navigators had in the palmiest days of sail.

So Eric the Red and Lief the Lucky, and Hawaii Loa, and Columbus, and Gilbert, and Raleigh, and Drake, and Cook, and Nelson, and Farragut, and Cressy, and Samuels, and all the great captains of wind and tide will hail this latest recruit in their hall of fame, who more than any other flier has demonstrated the possibilities for a man and his ship in the air.

The Foreign Trade Balance

THE foreign trade of the United States last year continued to make substantially the same rate of growth that has marked its course for the last decade. Both exports and imports were greater in volume than they have ever been before.

Some phases of our present trade position are of particular interest. Europe's proportion of our exports is 14 per cent less than it was twelve years ago and Europe furnishes 20½ per cent less of our imports than she did, in the average, during the 1910-1914 period. It is when other parts of the world are taken into account that the real development of our trade is clearly disclosed. While Europe's percentage of our trade has decreased during the last twelve years, the share of each of the other major divisions of the world has increased. We are selling more as we buy more, and that is as it should be. Imports from Asia, for example, have quadrupled in that time; and exports to Asia have more than quadrupled.

Trade statistics comprehend our visible trade; exports and imports of merchandise, raw materials, semi-finished or partly processed products of manufacture, and completely finished articles ready for consumption. They tell the story of our trade opportunities.

When we come, however, to consider the balances of trade between countries, there are other items which must be taken into account, aside from the commodity balance of trade; more particularly, services, shipments of gold, and remittances in currency or credit documents from people in one country to relatives or others in other countries. The balance will be struck ultimately between total exchanges of all kinds rather than between exchanges of goods alone. To reach that balance with any approximation to the truth, the figures and estimates for all the world must be considered.

It is neither necessary nor wise for any nation to insist upon an even exchange of goods with any and every other nation. What one buys anywhere enables the seller to buy where it finds its best advantage. It is the sum of all the purchases which balances with the sum of all the sales. The way to prosperity for the United States and for all other nations is along the line of increased production and lower cost, for that is what makes power to purchase and consume.—(From an address by James A. Farrell at the Fourteenth National Foreign Trade Convention, Detroit, May 27, 1927.)

⁂

Maxim Silencers

The Maxim Silencer Company of Hartford, Conn., through W. D. Stone, vice-president, announces the appointment of Eugene V. Winter of San Francisco to the position of Pacific Coast marine sales representative. Land and stationary business is to be in charge of Smith-Booth & Usher.

⁂

Another Straw

Our Paris Correspondent advises that the Standard Oil Company of New York has placed an order with Krupps at Kiel for a 15,000-ton twin-screw tanker with diesel engines. P.C. asks in the same dispatch if it is true that the famous Cramps shipyard is going out of the shipbuilding business. Alas, P.C., it is true.

Total United States Exports From and Imports to Leading 60 Foreign Ports for Fiscal Years Ending June 30, 1924 and 1925

Ports	1925		1924	
	Ranking	Long tons	Ranking	Long tons
Tampico, Mexico	(1)	12,117,228	(1)	14,187,957
Hamburg, Germany	(2)	3,066,471	(3)	2,594,368
Rotterdam, Netherlands	(3)	2,649,688	(8)	2,105,812
London, England	(4)	2,620,136	(4)	2,449,132
Antwerp, Belgium	(5)	2,565,499	(6)	2,175,230
Ft. Williams, Canada	(6)	2,413,526	(2)	3,946,316
Liverpool, England	(7)	2,275,968	(7)	2,121,396
Habana, Cuba	(8)	2,274,734	(9)	1,887,352
Port Arthur, Canada	(9)	1,938,071	(5)	2,411,396
Montreal, Canada	(10)	1,922,441	(11)	1,426,932
Buenos Aires, Argentina	(11)	1,408,362	(12)	1,397,263
Genoa, Italy	(12)	1,336,049	(15)	1,040,570
Bremen, Germany	(13)	1,312,981	(17)	894,846
Havre, France	(14)	1,083,599	(16)	967,629
Yokohama, Japan	(15)	1,062,846	(13)	1,394,205
Cruz Grande, Chile	(16)	1,036,979	(18)	879,443
Rio de Janeiro, Brazil	(17)	1,006,502	(20)	820,908
Shanghai, China	(18)	814,588	(14)	1,237,875
Manchester, England	(19)	774,061	(22)	777,121
Port Colborne, Canada	(20)	741,580	(23)	764,569
Vancouver, Canada	(21)	732,144	(21)	791,098
Calcutta, India	(22)	726,096	(27)	598,400
Sault Ste. Marie, Canada	(23)	714,733	(10)	1,490,972
Cristobal, Canal Zone	(24)	699,132	(32)	528,915
Cienfuegos, Cuba	(25)	660,719	(30)	544,217
Manila, P. I.	(26)	634,541	(25)	639,448
Port McNicoll, Canada	(27)	632,589		
Kobe, Japan	(28)	588,351	(19)	845,730
Iquique, Chile	(29)	584,367	(34)	500,461
Hull, England	(30)	556,774	(29)	578,975
Santos, Brazil	(31)	548,183	(31)	538,456
Antofagasta, Chile	(32)	546,672	(44)	409,870
Nuevitas, Cuba	(33)	528,183	(33)	524,169
Port Tarafa, Cuba	(34)	525,992	(48)	331,058
Marseilles, France	(35)	510,303	(28)	586,562
Matanzas, Cuba.	(36)	506,901	(38)	474,855
Rouen, France	(37)	464,190	(37)	483,782
Glasgow, Scotland	(38)	436,463	(39)	460,836
Cobourg, Canada	(39)	431,611	(24)	652,887
Pelee Island, Canada	(40)	407,881	(41)	436,349
Naples, Italy	(41)	402,529	(58)	290,741
Hong Kong	(42)	395,987	(36)	489,481
Dunkirk, France	(43)	379,256	(40)	454,796
Rosario, Argentina	(44)	371,183	(53)	314,449
Copenhagen, Denmark	(45)	366,498	(47)	357,589
Avonmouth, England	(46)	355,870	(46)	380,912
Balboa, Panama	(47)	354,927	(35)	496,080
Osaka, Japan	(48)	354,744	(45)	399,989
Antilla, Cuba	(49)	353,467		269,419
Sagua la Grande, Cuba	(50)	351,670		242,535
Fowey, England	(51)	346,631	(51)	318,722
Sydney, Australia	(52)	344,933	(57)	296,575
Southampton, England	(53)	338,829		142,336
Huevla, Spain	(54)	328,198		269,120
Talare, Peru	(55)	321,164	(49)	325,423
Montevideo, Uruguay	(56)	311,947		282,743
Santiago, Cuba	(57)	310,228	(43)	427,447
Caibarien, Cuba	(58)	308,662		283,573
Daiquiri, Cuba	(59)	306,149	(60)	287,229
Curacao, D. W. I.	(60)	305,011		

Source U. S. Shipping Board.

Largest Wooden Ships Ever Built

Through the courtesy of F. C. Matthews, of San Francisco, we are able to publish the following extracts from old British and San Francisco prints describing a pair of very unusual vessels built by a shrewd Scotchman at Quebec over 100 years ago.

“IN 1824 and 1825 Charles Wood, a Scotch naval architect and shipbuilder, built two giant sailing vessels on the Isle of Orleans, near Quebec. These were designed to freight a huge cargo of square timbers across to Great Britain and the ships themselves were constructed unusually heavy and in such a manner that their timbers could be taken apart and sold on arrival. The idea behind the scheme was to evade the British Timber Tax by practically building the ship out of the cargo and thus avoiding the duties.

“The first vessel, the Columbus, of 3690 tons and 301 feet in length was successfully launched and sailed across to London. Instead of breaking her up on arrival as intended, the owners unloaded the timber in her holds and dispatched her to St. John, N.B., for another cargo, but she foundered on the voyage across. The second vessel, the Baron of Renfrew, was larger still, being 5294 tons. She left Quebec in 1825 and reached the English Channel safely, but got ashore on the Goodwin Sands while in charge of the tow boats. The crew were saved with much difficulty but the Baron was a total loss.

“These two vessels were rigged as, what we would nowadays call, 4 masted barks, and they were the largest sailing vessels to make a transatlantic passage up to that time.” (Fairplay, London.)

“Probably the largest wooden sailing ship ever built was launched at Quebec on June 25, 1825. This was the timber ship Baron of Renfrew. An account of her launching taken from an old paper published 50 years before the Commercial News was born, gives the following regarding her dimensions: length, 309 feet; beam, 60 feet; depth, 38 feet internally, 57 externally; tonnage 5888. Mainmast above deck, 75 feet; whole length, 104 feet. Mainyard, 75 feet. Bowsprit, 60 feet. Draft loaded, 24 feet. Length of tiller, 28 feet, diameter, 14 inches. Hemp cable, 27 inches, 100 fathoms, weight 126 cwt. Chain cable, 120 fathoms, links 14 inches long, 7 inches over, of 7-inch bar iron. Cargo on board when launched, 4000 tons of timber. Cargo capacity, 8500 to 9000 tons. 30 times around the capstan made a mile; 4 times the surface of the deck, one acre. 3000 tons of timber to build her; 12 tons of oakum, 125 tons of iron. She was lost on the Flemish Banks in October of the year she was launched.” (From San Francisco Commercial News about 1890.)

Placing the College Graduate

THE rapid increase of personnel departments among all the larger business and industrial institutions of the country is evidence of the growing recognition of the business man’s most perplexing problem—that of securing satisfactory human aid. Also in answer to this problem there have arisen institutions to find places for men and women which will give them an opportunity to develop their talents to the fullest extent in ways which will bring mutual satisfaction to themselves and their employers.

One of the most successful of these institutions has been the Alumni Bureau of Occupations of the University of California. This establishment, which is operated for the benefit of the graduates and students of the University of California by the California Alumni Association, has made a special study of fitting the individual to the position and as a consequence has won high regard from those employers who have made use of its service.

As the University of California is in effect the largest “Plant” in the state and one in which every taxpayer is a stockholder, it is the logical place for business men to look for competent young assistants. Having spent four years being made better citizens and better thinkers at the expense of the state, graduates of the University are generally thoroughly grounded in those fundamentals so necessary to real business success, and properly placed are capable of making a genuine contribution to the establishments they enter.

These facts are already recognized by many of the larger corporations who today look almost entirely to the Universities for the material which they expect to develop into executives and administrators. But university graduates are also trained in scores of fields besides the industrial. Many of them are well equipped for mercantile, advertising and other fields.

The Alumni Bureau of Occupations, which is the center for placements for University of California Graduates is located at 301 Stephen’s Union, Berkeley, and 855 N. Vermont Avenue, Los Angeles.

A Free Engineering Education

THE Webb Institute of Naval Architecture announces that on June 21 competitive examinations will be held for free scholarships.

The Institute owes its existence to the generosity of William H. Webb, a great New York shipbuilder in the Civil War period. It was so liberally endowed that accepted students obtain not alone free instruction, but free board, lodging, and laundry during their entire four years of training.

Primarily the instruction given is in naval architecture and marine engineering, but graduates are so thoroughly grounded in engineering studies that many of them enter the fields of electrical and mechanical engineering and are filling many important places in these professions.

The Board of Trustees at its annual meeting announced that hereafter a post graduate course in Aeronautics will be provided for those desiring the same by special arrangement with the Guggenheim School in the New York University, located within a very short distance of Webb Institute.

To become eligible to enter this competition young men must be American citizens not less than 16 nor more than 21 years of age, have an education equivalent to the average high school requirements for graduation, and submit letters of recommendation as to character, etc. It is estimated that there are 10 vacancies to be filled.

Candidates in and about New York will be examined at the Institute in Fordham, New York City. Candidates from other parts of the country may be examined at the nearest large city to their homes, by special arrangement.

Applications should be addressed to the Dean, Webb Institute of Naval Architecture, 188th Street and Sedgwick Avenue, Fordham, New York City.

The Longshoremen's Compensation Law

By Warren H. Pillsbury

ON MARCH 4 of this year, President Coolidge signed the Federal Longshoremen's and Harbor Workers' Compensation Act. This act constitutes a further important step toward the rationalizing of treatment of injured workers, and partially completes a ten-year fight to obtain tardy justice to both employer and employe in this industry.

With the enactment of workmen's compensation laws by the different states commencing in 1911, it was soon proved to the satisfaction of all concerned that workmen's compensation legislation was superior to the older system of trying personal injuries to employes by damage suits. To the injured worker it gave speedy and inexpensive relief and restored a portion of lost wages during the time when financial aid was most needed. To the employer it substituted a fixed and limited liability, easily and quickly determined, for long, drawn-out damage suits with high court expenses and verdicts for unlimited amounts.

1917 Act Unconstitutional

For the first six years of practice under state workmen's compensation acts, it was assumed that the state law would apply to sailors and longshoremen in the absence of any act of Congress upon the subject. In April, 1917, however, the United States Supreme Court held that the inadequate rules of the maritime law must be applied and could not be altered by state legislation. In October, 1917, Congress passed a statute to restore to maritime workers state workmen's compensation protection. This law was declared unconstitutional by the United States Supreme Court.

Jones Act

In 1920 Congress again took up the maritime personal injury problem, this time attempting to differentiate between seamen on one hand and port and harbor workers on the other. By Section 33 of the Jones Act, seamen were placed under the Federal Employers' Liability Act, previously applicable only to railroad employes injured in interstate commerce. State compensation acts were restored for port and harbor workers. The latter provision was again declared unconstitutional by the Supreme Court.

For several years bills have been pending in Congress to provide a uniform federal compensation act for maritime workers. The ship owners have at all times been favorable in principle to such bills. Stevedores' and longshoremen's organizations have also worked for them; but by unjustifiable idiosyncrasies the seamen's organizations have fought them. The reason assigned has been a desire to keep both the right to a damage suit for unlimited damages and the right to compensation. This is inconsistent with all compensation legislation in the state.

Present Act

The principal measure, whose provisions were largely followed in the bill which was just passed, was framed by the New York Association for Labor Legislation, with the assistance of Dr. John B. Andrews, Professor Joseph L. Chamberlain of the Columbia Law School, and Dr. Miles M. Dawson, with occasional suggestions and criticisms from others, including the writer. There was much discussion in the congressional committee over details of all measures presented and particularly over a strong attempt to retain seamen within the law. In the closing hours of the session, a redraft was rushed through both houses without further committee hearings, which is the present law.

Some Loose Ends

While it is apparent from reading the act that there are some loose ends which will require court construction and that it will take considerable litigation before the law will be well understood, the measure is upon the whole quite satisfactory in its general plan. The law applies to disability or death sustained by employes in maritime employment in the whole or in part upon the navigable waters of the United States, including any drydock, where recovery is not provided by state law. This latter provision will be a fruitful source of litigation for many years.

The law does not include injuries sustained by a master or member of a crew of any vessel or any person engaged to load, unload, or repair any small vessel under 18 tons, net. By a process of elimination it therefore applies to all port and harbor workers except upon such small vessels, but excludes seamen who still remain under the Jones Act. Whether work upon small boats will now come under the Admiralty Law or the state compensation act is an open question.

Scale of Benefits

The scale of benefits under the new law is higher than under the California Act. Maximum payments of weekly compensation are $25 a week instead of the $20.83 under the California law. Compensation is payable at the rate of 66-2/3 per cent instead of 65 per cent. Permanent total disability entitles a workman to 66-2/3 per cent for the rest of his life, instead of 40 per cent as under the California Act. Specific authorization is given to allowance for facial or head disfigurement, not exceeding $3500. For death benefits a surviving widow is entitled to 35 per cent of her husband's wages until her death or remarriage, with 10 per cent additional for each minor child until each child becomes eighteen years of age. The California death benefit is 65 per cent for 240 weeks with nothing further. Under the Federal Act the death benefit payable to a widow may approximate $15,000 or $20,000.

The employer's liability for medical treatment is unlimited as under the state law.

Insurance under the Federal Act is compulsory and may be taken out in any insurance company authorized by state or federal law to write workmen's compensation insurance in the jurisdiction in which the employer operates. This includes state compensation insurance funds. Self-insurance may also be engaged in under permission upon the deposit of an indemnity bond.

Stevedoring companies must present a certificate showing that they have complied with these provisions concerning insurance before they can be employed by any vessel. Failure to comply with insurance provisions entails a fine of $1000 or imprisonment for one year.

The law is to be administered by the United States Employes' Compensation Committee, which is to appoint deputy commissioners in each state or district.

The validity of decisions of the deputy commissioner is to be tested by the injunction proceedings in the United District Court with eventual right of appeal to the Circuit Court of Appeals or the United States Supreme Court, as in other cases.

The act takes effect July 1, 1927.

[Western Safety Journal.]

Inland Waterway Development

An Old Problem Enters Into a New Phase Which Gives Great Promise of Sucess

Norman F. Titus, Chief, Transportation Division,
Bureau of Foreign and Domestic Commerce.

FOR nearly a century inland waterway transportation has been of great importance to the United States. For a time, it was considered of greater importance than the railroad transportation; later, it was driven nearly from existence by railroad competition. When interest in our waterways seemed at lowest ebb, the World War again emphasized their value and the economic consequences of the Peace focused attention upon their great possibilities.

Probably the most far-reaching effects of the war in the United States are disclosed in the mid-west territory. In the Mississippi Valley the economic situation is considerably distorted; there is much agricultural distress and incessant demands for remedial legislation. This situation, to a large extent, has been brought about by transportation changes. Increases in railway rates since the war force the mid-west farmer to pay from 6 to 12 cents more per bushel to reach world markets than before the war. Foreign farmers produce close to ocean ports and pay but little, if any, more than pre-war costs, because shipping rates are substantially at pre-war levels. While it is true that these rate increases apply only on the exports of grain, nevertheless the price which the farmer receives in foreign markets is the principal factor in determining his return upon the whole crop, not alone the export balance. It is this transportation differential that is, unquestionably, one of the most important causes for our present agricultural depression.

Solution for Agricultural Depression.

Transportation has thus largely been responsible for this economic distortion, and many competent observers claim that, instead of legislative marketing devices, the real remedy lies in cheaper transportation. The inland waterway is the cheapest medium of transportation, and it is asserted that here is an instrument which will have a beneficial effect, and tend largely to restore the former satisfactory economic situation in the mid-west.

In the press much is seen of proposals for a Great Lakes-to-the-Ocean waterway, and for a waterway from the Lakes-to-the-Gulf. All of this agitation tends to concentrate attention on the inland waterway problem. While there are many people who claim that over half a century of experimenting has demonstrated that inland waterways are a failure, nevertheless, at this very time we are witnessing the final results in a successful demonstration of inland waterway transportation by the United States Government. Herein lies our hope and confidence for the future.

This successful waterway experimentation by the Government has been carried on largely by the War Department, and its records disclose a most interesting narrative. Taken from the War Department reports we find this new development in inland waterway transportation to be as follows:

Council of National Defense.

In an act of Congress approved August 29, 1916, a Council of National Defense was established for the coordination of industries and resources for the purpose of more adequately insuring national security and welfare. One of the functions of that body, as defined by the act, was to supervise and direct investigations and to make recommendations to the President and heads of executive departments looking to the more effective utilization of domestic waterways.

Committee on Inland Water Transportation.

These latter duties led to the appointment on June 15, 1917, of the Council's "Committee on Inland Water Transportation," with Major-General W. M. Black, then Chief of Engineers, United States Army, as chairman, and Daniel Willard, chairman of the Advisory Commission of the council in special charge of transportation matters, as a a member ex-officio. The particular purpose of this committee, and that to which its efforts were mainly addressed, was the study of the feasibility of utilizing the navigable waterways of the United States for the relief of war-time freight congestion on the railroads, which was then beginning to be felt keenly, and which it was appreciated, in view of the accelerating military program, must soon have an important bearing upon the whole proposition of national security.

This subject was investigated and considered by the special committee of the Council of National Defense under the headings:

First. What carriers, including those owned by the Government, were available for immediate service in inland waterways; their geographical distribution, tonnage, type, service for which adapted, physical condition and employment.

Second. What obstacles, such as navigational limitations, loading and unloading facilities, discriminating rail rates, etc., interfered with the full use of existing tonnage.

Third. What steps were necessary for the creation and permanent use of a considerable fleet of water carriers of a commercially useful type.

Accomplishments of the Committee.

Proceeding along these lines the committee carried on, in conjunction with the Department of Commerce and through correspondence, personal interviews, and attendance upon conventions, a campaign of education with a view of awakening public interest in the traffic possibilities of inland waterways. Examinations were also made of a number of waterways and also surveys were made of the available craft, terminal facilities, and traffic conditions on these waterways. Experimental trips were undertaken on numerous waterways, and it was demonstrated that a very large volume of freight then moving by rail could be diverted profitably to these waterways and thereby measurably relieve congestion of rail traffic.

One of the first concrete results of these investigations was the allotment by the United States Shipping Board, at the instance of the President and upon the approval of the Secretary of War and the Secretary of Commerce, of the sum of $3,360,000 (later increased by an additional allotment of $500,000) from the funds of the Emergency Fleet Corporation for the construction of a fleet of 24 steel barges and 4 steel towboats to be used in transporting coal mined in Illinois, upstream on the Mississippi River from St. Louis, Missouri, to St. Paul, Minnesota, and bringing a balancing

(Continued on Page 13, Advertising Section.)

The On-Coming Wave of Foreign Combinations

By C. C. Martin

WE HAVE power in wealth, natural resources, men, and brains. No other nation possesses power in such degree. But combinations of nations can match our strength, and a giant can be weakened by restrictions that inhibit free action. Our competitors throughout the world are drawing closer together, they are working against us in many ways. We must open our eyes wide to this fact.

Technically the United States is the marvel of the world. Commissions from all outstanding countries are coming in continual pilgrimages to our shores for the purpose of discovering by what magic we have created the greatest example of homogeneous power, prosperity, and individual happiness the world has ever known. When these commissions return home, long reports are published describing in detail the many blessings enjoyed by the people of these United States, and the observers try with every faculty they possess to discover how far and in what way the various springs of our well-being may be applied in their own respective countries.

The truth of these facts is beyond cavil as is also that of the other side of the picture. Technically we may be the marvel of the world. With reference to business or social legislation we are not the marvel of the world. Our statute books are filled with laws the purpose of which is to inflict our people with all manner of individual restraint and prohibition, laws governing our business activities being particularly repressive, inadequate, and unsuited to the exigencies of modern industrial and commercial life. If our laws stopped at monopoly we could not complain. But prohibition of wise cooperation that prevents ruinous competition is bad for the nation and its citizens.

Combinations Often a Necessity

The passage of the Sherman Act took place in 1890, and was the result of national emotion produced by great activity in business combination that occurred in the latter part of the nineteenth century. Reverting to old principles of economics and to theoretical points of view, it was felt that safety lay in legislative provision for absolutely free competition, and in legislative fiat against anything that might hamper such competition. The grave defects of unrestrained competition were not appreciated at that time. Since the passage of this act, however, business has entered an entirely new phase characterized by conditions utterly unlike those of 1890. We freely and frankly recognize today that combination in business is frequently a necessity, that it has potent advantages, that whereas absolute power should be given to no class of our population, reasonable freedom is a necessity and prerequisite to normal development in any path of life. Likewise we know that the old ideal of unrestrained competition has most unfortunate phases, resulting in developments frequently imperiling capital funds invested in enterprises as well as the well-being of countless workers depending on pay envelopes, themselves the result of careful attention to well-known rules of industry and distribution.

In most countries of the world business combinations are considered dynamic things, as business is dynamic. Regulation is looked upon as a moving point that must adapt itself to that living organism we know as business. An economic law passed nearly forty years ago, however well it might have been adapted to conditions of that period, can hardly serve a useful purpose at present. This fact has been strikingly proved by recent decisions where our courts, faithful to their duty in carrying out provisions of existing law, have held that no matter what the benefits accruing from combination, no matter how helpful these combinations may be to the public at large, no matter how great the economies brought about, if competition is restrained it is contrary to the spirit and letter of our laws and consequently cannot be permitted.

In many other countries, our chief competitors, the situation is differently treated. Regulation of business proceeds along lines of economic analysis. Conclusions and practice are not fixed by any specific formula, but judged by broad principles of public advantage and public policy, and not by legislative and repressive fiat. As a result of this, business men of the United States find themselves severely handicapped, not alone with reference to national affairs, but particularly in relation to international trade. Nationally our trade associations and thousands of other groups dealing with economic problems, are suffering keenly because legitimate and proper activities are inhibited and forbidden. All of which has its direct effect on our international trade, as this is necessarily based on domestic organization and practice.

Secretary Hoover Points Out Our Inconsistent Practice

Secretary Hoover in a recent statement well described the situation by stating that the vast growth during the past twenty-five years of associational activities represent "better synchronizing of the parts of the economic machine. I could point out a thousand accomplishments during the past five years of cooperation serviceable not only to themselves but to the public. The improved employment relations are one reflection of this new spirit of cooperation. Another has been the steady improvement in business ethics through the establishment of business codes and their enforcement. No one can review the situation today in comparison with that of twenty-five or thirty years ago without a sense of deep relief. The whole process of eliminating waste through standardizing of dimensions, qualities of goods, and business practice, is only possible by such cooperation. And these accomplishments involve not only the units of a given trade, but also cooperation between the many producing and consuming trades of a given community. As still another example, I might cite the widely successful organized cooperation between several score different shippers and transportation organizations for the more regular and efficient transportation of goods.

"These undertakings result not only in greater economy in production and consumption, but also eventuate in less cost to consumer. There are today literally thousands of such cooperative movements in progress. They were almost unknown a quarter of a century ago.

"Yet the public has the natural fear that these great units will be used for domination . . . Arising from this fear . . . we have enacted much legislation . . . The original conception of this legislation seems to have been to maintain a great host of highly competitive units in every trade. By degrees we have been retreating from this notion because the competition it required became at times highly destructive. We have modified its application to organized labor. It has been partially, and probably will be fully, withdrawn as to cooperative agricultural marketing.

"We have found that to maintain complete competition in service to each consumer of the utilities—transportation, light, power, and communications—meant a fabulous cost in duplication of equipment with less financial stability, increased operating expenses, poorer service and increased rates to the consumer. The Federal Government and most of the 48 states acting independently, have abandoned such a degree of competition as the method of holding down rates and holding up service, and have established regional monopolies.

"Our ideas in the other trades, however, are a good deal muddied. . . . A consolidation by purchase of units controlling 45 per cent of the output of an industry has been held legal; and yet if a number of men owning collectively a much smaller percentage should contract or combine to control production or distribution, they stand in danger of prosecution. Right or wrong, either way, we are at least inconsistent. . . . Public interest does not require that Mr. Ford, who makes over one-third of our automobiles, shall dissolve his great factory into the hands of 500 small competitors."

Secretary Hoover is not a lone voice crying in the wilderness, but reflects a movement which has been steadily growing. Congress is conscious of the fact that our basic anti-trust legislation is inadequate, and consequently the Export Trade Act of 1918 and the Edge Act of 1920 permitted modified combination in foreign trade and broadened the Sherman and Clayton laws. The Act creating the United States Shipping Board in 1916 provided for pooling and other agreements between carriers by water, while the Merchant Marine Act of 1920 exempts marine insurance companies from the provisions of the Clayton Act. Our Federal Transportation Act of 1920 provides for consolidation of railroads and express companies, something looked upon with terror forty years ago.

All of these things show a definite retreat from our former uncompromising attitude. The movement has progressed even further. Our government does not hesitate to support the withholding of millions of bales of cotton from the market, our Congress recently passed a bill that would have fixed the prices for a colossal volume of agricultural products, while business and industry devise innumerable forms of control; holding companies of various sorts, patent pools, merchants becoming agents and manufacturers, different forms of licensing, and so on. Our trade associations to the number of some 25,000 are actively seeking to find some formula which will permit them to regulate production and prices without running against our anti-trust laws. There is no question facing us that demands solution more imperatively than this one of remedies for the obvious and proved defects of our present situation.

Regulation of Combinations Abroad

The different approach taken by many foreign countries is well illustrated by the fact that investigation and adjustment of a situation arising out of business combination, is not the work of courts of law nor is it crowded into the narrow mold of rigid legal form. Decisions are based on public welfare, not on words the meaning of which is in dispute. In Canada the Minister of Labor takes charge; in Argentina, the Minister of Agriculture; New Zealand, the Minister of Industries and Commerce; South Africa, the Minister of Mines and Industry; Germany, the Cartel Court under the Ministry of Economics; and that combinations effecting competition are not damnable per se, is indicated by the interpretation of laws that have been passed from time to time providing for such regulation as may be considered necessary by the officials charged with this duty.

For example, Great Britain has its laws covering contracts in restraint of trade, but the British Committee on Trusts stated in 1919 that "free competition no longer governs the business world." Indeed in England combines are favored and the government itself is active in some of them. Agreements which may be against public welfare are unlawful in Germany, and the Cartel Court was established in 1923, but freedom is practically unrestrained. In France there are laws against restraint of trade, but they have little effect on the movement of business. The preferred form is the comptoir, an incorporated trading company composed of manufacturers who appoint the comptoir their selling agent with power to fix prices and so on. As far back as 1830 French courts held that it was no offense to maintain prices, the offence lying in raising prices. The comptoir has been generally upheld in recent years when it has limited production and fixed prices. In Belgium the preferred form is also comptoir, but the activity is much more drastic than that in France, the Belgian comptoir doing just about as it pleases. Italy also prefers the comptoir form, and although there are legal provisions against combination interpretation is liberal. Switzerland permits any form of combination. Austria, Sweden, Spain, the Netherlands all offer many combinations exercising greater or less control of trade and industry.

Foreign Combines a Source of Strength

It is frankly stated by many European business men that their commercial strength depends in the main on combines, and Germans are particularly convinced of this so far as their own country is concerned. Australia has developed a most extensive list of combinations, governmental and private, while Japan is as free as Switzerland so far as combines are concerned, the government backing every trade force that will lead to the aggrandizement and advance of Japanese commerce. Cotton prices have been strenuously supported by the Egyptian government, and government monopolies of cocoa, coffee, quinine, sisal, and many other things too well known to require more than passing mention.

Under the stimulus of the exigencies of modern trade, with the prospect of economies and benefits accruing from one or the other of innumerable forms in which combinations emerge, the movement both in this country and abroad is daily growing more vigorous and definite. The distinction, however, between the United States and other countries lies chiefly in the fact that, in the principal exporting countries, activity is practically untrammeled and nationals may combine among themselves or with those of other countries, sure that their activities will not meet with governmental protest and that they may utilize every facility for the purpose of strengthening their work from a production or distribu-

(Continued on Page 23)

HAWAII LOA IN THE FIFTH CENTURY
FOLLOWED THE EASTERN STAR AND DISCOVERED
THE ISLANDS WHICH BEAR HIS NAME
HAWAII

The Hawaiian window from the series of art glass decorative windows in the great central hall of the dining saloon.

HAWAII WELCOMES the WORLD

The medallion in the rubber tile flooring at the center of the rotunda on B deck. "The Aloha of Hawaii to everyone."

Passenger Liner

CITY of HONOLULU

Sets New Pacific Ocean Standards

For Passenger Accommodations

JAS COOK OCEANI INVESTIGATOR ACERRIMUS
CAPTAIN JAMES COOK
VISITED AND EXPLORED THE
ISLANDS OF HAWAII IN 1777.
BRITAIN

The British window of the art glass series.

Photos by Mattingly, Los Angeles Steamship Co.

New Passenger Liner City of Honolulu

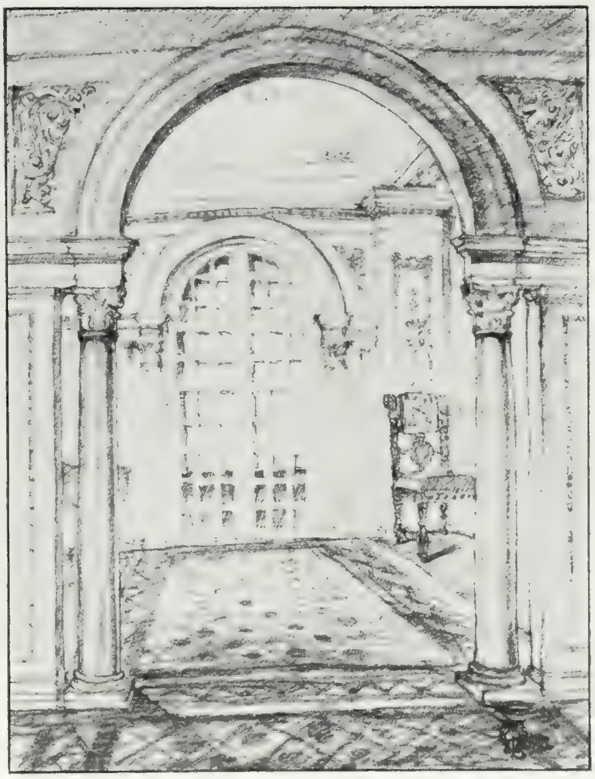
Los Angeles Steamship Company Builds Modern First Class Floating Hotel for Los Angeles-Honolulu Service

AT THE plant of the Los Angeles Shipbuilding & Drydock Company, San Pedro, California, Pillsbury and Curtis of San Francisco have just completed the finest, most elaborately equipped, most beautifully decorated, and largest first-class passenger accommodations ever built into a vessel at a Pacific Coast shipyard. We refer to the City of Honolulu, built under the personal direction of Walter L. Martignoni of the San Francisco firm for the Los Angeles-Honolulu service of the Los Angeles Steamship Company.

Architectural detail in corner of central hall of dining saloon.

The City of Honolulu is 545 feet long and 61 feet beam, with a displacement of 21,000 tons. Her hull was built in Germany of copper bearing steel and is in splendid condition. Practically everything in this hull, with the exception of the main engines and propeller shafting, was stripped out, and on the foundation thus prepared, Mr. Martignoni and the organization under him built accommodations for 445 first-class passengers, 50 third class passengers, and for the necessary officers and crew, and installed the requisite equipment and mechanism for the operation and navigation of the vessel and for the comfort and service of this passenger list.

In order to allow ample space for large public rooms, the new superstructure was extended both forward and aft, as is strikingly shown in the progress pictures reproduced herewith. This de luxe liner now has four complete passenger accommodation decks under the boat deck. These decks are lettered from the top down, A, B, C, and D. Each deck has several unique and interesting features.


Architectural detail of one of the entrance doors of the music room, looking aft.

Let us imagine that it is our good fortune to have a reservation on A deck and that we are going aboard to sail for Honolulu. The wharf gangway takes us on to B deck and we are pleased to feel under our feet the smooth soft texture of the East Indian teak, with which all the open spaces of the decks on this steamer are laid. Wide entrance doors lead to a spacious lobby well furnished with soft easy davenports. Opening on to the center of this lobby is a wide counter with a beautiful bronze grill, back of which is housed the purser's office.

Following the boy with the grips, we go forward along the passageway and are immediately impressed with the motif indicated in the scheme of decoration. Standing out in rather bold relief against the ivory white of the paneling the capitals of the pilaster strips are molded and colored to show, alternately, the golden poppy of California and the scarlet hibiscus of Hawaii, a most pleasing and suggestive intertwining of official flower emblems.

Grand Circular Stairway

The port and starboard passageways on B deck open forward into a foyer in which we will pause to admire the double circular grand stairway which is one of the unique architectural features of this vessel. We are at once struck with the idea that the graceful spiral is, as it were, woven into the ship's structure and festooned from deck to deck with no intermediary supports. On inquiry we learn that the stairway was actually laid out in the mold loft, built of steel members by a ship fitter, and riveted into the hull in the same manner as a structural member. Our hats are off to that loftsman and that ship fitter; they are master craftsmen. This steel stairway, covered with rich hardwood paneling and fitted with an ornamental wrought iron rail, is a very beautiful architectural note, running in four flights from A deck to the swimming pool on E deck. Beyond the stair we catch a glimpse of a graceful rotunda, a skylight, and a large, well furnished double corridor in the background. But we will have to defer examination of these details for the boy is calling us to the elevator.

So we step in and are raised to deck A. Here the boy ushers us to starboard from the elevator and into Suite 101, which opens off the foyer. Suite 101 and Suite 102, opposite, consist of sitting room, bed room, and bath room decorated and furnished in the period style of Louis XVI and differing only in the color schemes.

Beautiful Suites

We find our bed room furnished with beds, beautifully modeled wooden bedsteads in the Louis XVI period style fitted with the famous Simmons Beauty Rest mattress and with the finest of bed linen, blankets, and comforts. We rather expect this in a suite, but we are to learn on investigation that every stateroom on the ship is furnished with beds and all beds are equipped as described above. In a number of the first-class staterooms, the latest type of Simmons Pullman folding berth is installed so as to make convenient arrangement for families or parties in one room. This is said to be the first installation of Simmons Pullman berths on a Pacific Coast vessel. All of the furnishings, carpets, and hangings of our suite are in perfect harmony, and the bathroom is a gem with built-in tub, equal to the finest apartment house ashore.

Passing through our rooms we emerge on a wide glass enclosed promenade. The windows are of plate glass and the small brass crank under the center of each suggests the windows of our sedan. Sure enough! On test we find the single sheet of plate glass is lowered and raised very easily by turning this crank. The mechanism operating these windows was designed for our comfort by the Kearfott Engineering Company of New York. Here, as on B deck, we will love the feel and the aroma of the East Indian teak deck.

This enclosed promenade, ten feet wide, and with a length of 150 feet on each side of the vessel, emerges into open promenade deck spaces 10 feet wide for another 150 feet length on each side, and then the full width of the ship for 100 feet. All of this space is laid with teak and planed to a perfect surface, making an ideal promenade, dancing, or lounging floor. Forward of the enclosed promenade, and approached through double storm doors, is an open deck space 30 by 60 feet, whereon the more ardent lovers of sea adventure may tread the bridge and breast the gale in true seaman style.

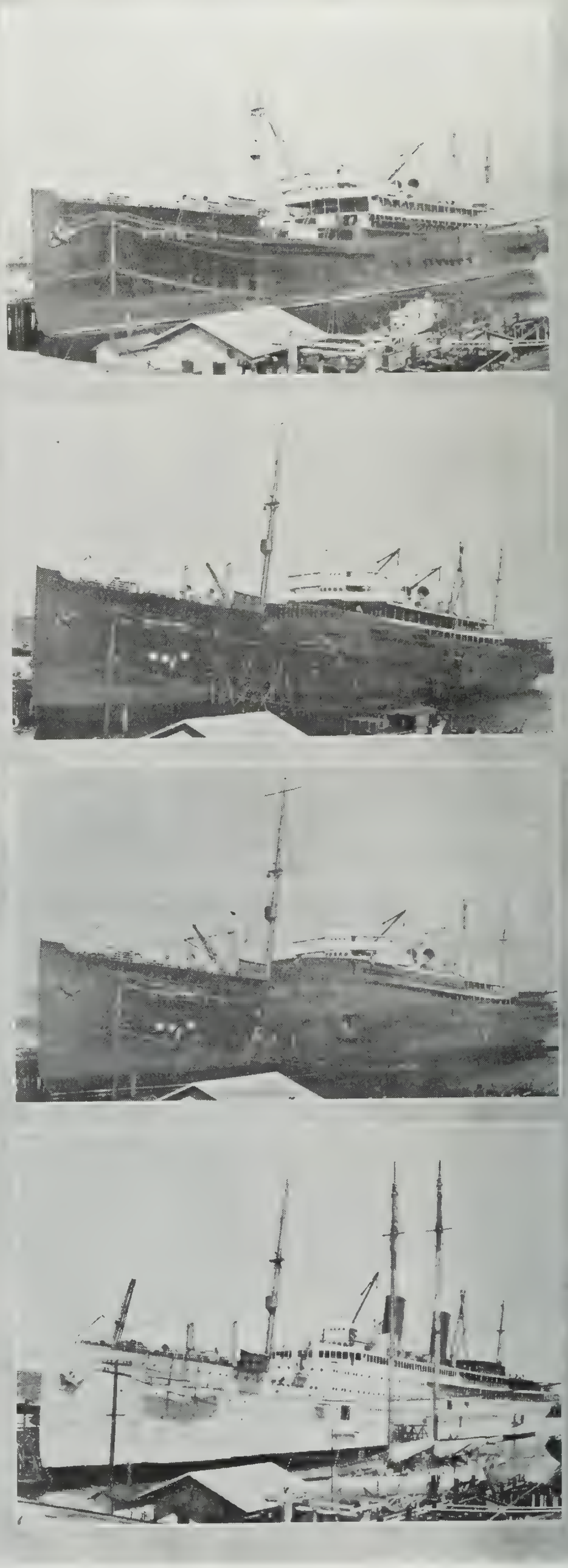
Period Styles in Public Rooms

While examining in detail the public rooms of the steamship City of Honolulu, we should bear in mind that the naval architects and the interior decorators have accomplished something on this vessel never before attempted in Pacific Coast shipbuilding. Each of the rooms is designed, from an architectural standpoint, to conform with certain period styles of interiors, and all floor coverings, window drapes, wall hangings, furniture, and decorations are designed especially or selected for these rooms to carry out the same period motif. Under the direction of Mr. Martignoni of Pillsbury and Curtis, the architectural designs were prepared by Clinton B. Kolyer, naval architect of Los Angeles.

The color schemes, drapes, furnishings, and floor and wall coverings were selected by the Los Angeles Steamship Company with the advice and assistance of N. B. Dahl, manager of the Decorative Department of Goodan-Jenkins Furniture Company of Los Angeles.

Electric lighting fixtures, many of them special for this job, were designed and manufactured by Schweitzer-Alexander, Incorporated, of Los Angeles.

All composition relief ornamentation was made and applied by J. P. Weaver and Co. of Los Angeles, from the material Flexco, a preparation in which they specialize and which is adapted especially to surfaces subject to vibration and distortion, as it is applied in a flexible condition and gradually hardens without shrinkage or warping. This material is used in all relief ornamentation through the vessel.



The four pictures above give a very good idea of the way in which the superstructure of the steamship City of Honolulu was built to give four complete passenger accommodation decks. This vessel, without doubt, represents the largest passenger accommodations job ever undertaken in a Pacific Coast shipyard.

Carlo Romanelli putting finishing touches on statue of Kamehameha I for the niche in the dining room.

All colored art glass was supplied by the Judson Studios, Incorporated, of Los Angeles.

Plumbing and plumbing fixtures, with some exceptions which will be noted in passing, are Kohler or Sands, supplied through Sands of Philadelphia.

All plate glass and mirrors were supplied by the Los Angeles Glass Company.

Much hardwood trim is in evidence, such as teak, red gum, primavera, mahogany, and birch, all supplied by the noted San Francisco firm of White Brothers.

Much of the paneling and divisional bulkheads in staterooms, passageways, and public rooms is of Haskelite, of which over 70,000 square feet was used.

There are about 50,000 square feet of Vehisote supplied by the Pantasote Company in staterooms, ceilings, and panels.

On ceilings of passageways and public rooms where unbroken surface effect was desired, Sheet Rock, supplied by the U. S. Gypsum Company, was applied.

Public Rooms, A Deck

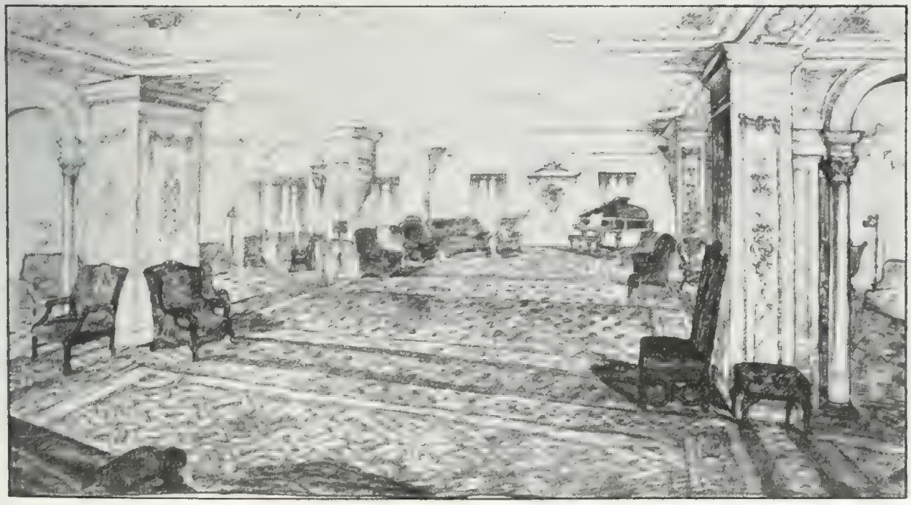
To continue with our inspection of A deck, having made the circuit of the promenade, let us reenter the foyer. Here the basic color is a chical gray enlivened by French blue silk moire hangings. Railings of the stair and rotunda wells are in ornamental wrought iron with bronzed motif and mahogany handrail.

The rotunda is topped by a ceiling light of colored leaded art glass, with motifs marine in character. The center features the seal of the Los Angeles Steamship Company and the Steamship City of Honolulu, surrounded by an aureole or sunburst ring with an outer ring containing the twelve signs of the zodiac. Large shell ornaments in brilliant color fill minor panels, while triangular spaces contain disporting dolphins and an interesting frieze of flying fish interwoven throughout. Six graceful columns support the rotunda dome effect, which is carried through from B deck to the boat deck above deck A.

On either side of the rotunda swinging glass doors give access from the foyer to the music room. Approximately 40 feet wide by 50 feet in length, this beautiful salon is in the French Renaissance, or Louis XVI, period style. Carpeted in a special French design of grey on a blue ground, with its wide windows draped with French blue silk moire and its walls in blue satin damask panels on a French grey ground with cream and gold trim, the music room emanates an atmosphere of restful charm that is emphasized by the numerous davenports, arm chairs and love seats whose trim and upholstery are in tune with the motif. A large leaded glass ceiling light is richly worked out in floral pattern, around the base of which runs a frieze incorporating ornamental placques with likenesses of some of the great composers — Beethoven, Liszt, Mozart, Chopin, Schubert, Mendelssohn, Brahms, Bach. Decorative wrought iron grilles have been skillfully introduced in the angles of the ceiling lights to provide for additional ventilation in tropical climes.

Presiding over this French music salon and giving a touch of contrast, there is mounted in a niche at the forward end and facing the entrances, a bronze statue of Kamehameha I, the great Hawaiian leader. This statue was produced by Carlo Romanelli, famous Los Angeles sculptor. The figure is three feet in height and is a faithful reproduction in miniature of the colossal statue of the Hawaiian king that stands in front of the Hall of Justice at Honolulu. The music room is, of course, equipped with radio reception and the best of amplifiers, and here, in comfort, the sea voyager may be entertained by the wealth of material available in broadcasted radio programs.

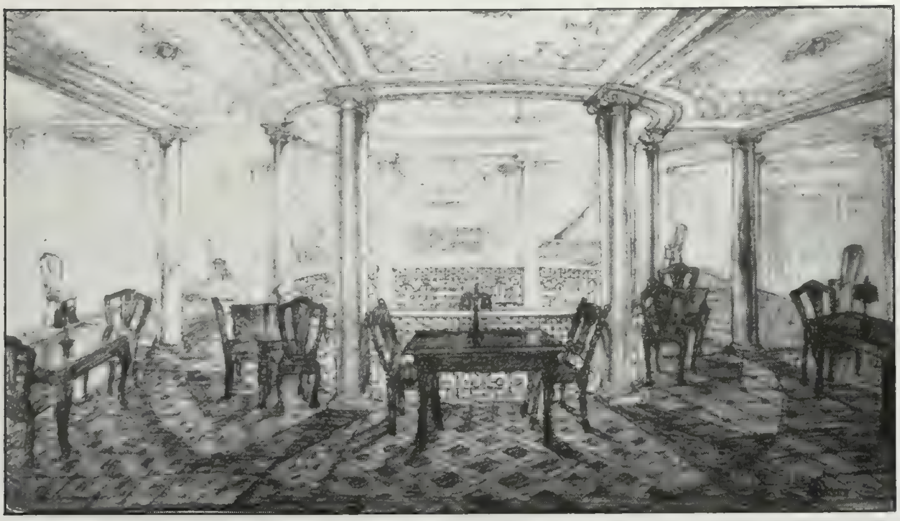
On A deck, amidships, there is a playroom for the younger children. This room is equipped with many devices for the entertainment and amusement of the little folks and is under the supervision of a competent play expert and nurse.



MUSIC ROOM.

The music room on the new passenger liner City of Honolulu is located forward on A deck with large windows open to the air on three sides. It has a clear floor space approximately 40 feet wide by 50 feet in length. As indicated in the illustration. which is taken from the architect's drawing, this room is furnished, equipped, decorated, and architecturally modeled in the Louis XVI period style.

In these days of superlatives it is customary for everything to be first in some way or other. This room is said to contain a larger number of pieces of overstuffed furniture than any other room afloat.



THE ROTUNDA FOYER.

Our illustration was taken from the architect's drawing showing the treatment of the foyer, grand central staircase, and rotunda aft of the space on B deck known as the writing room. It will be noted that the circular stairway is hung gracefully from the deck in a long spiral and has no intermediate supports. This is made possible by the fact that the stairway itself was modeled in steel by a ship fitter after having been laid out in the mold lot of the shipyard. Two 10-inch by ¾ channels form the side stringers on each wing of this stair. These support the steel treads and risers of the steps and are riveted into the structural members of the deck above and below. The steel structure is covered with beautifully finished hardwood paneling.

At the after end of the superstructure on A deck, a group of public rooms gives fine opportunity for a long vista effect, of which good advantage has been taken by the designers. The rooms are smoking room, tea room, and garden lounge. The space devoted to their housing is approximately 36 feet wide by 85 feet long and opens aft on to the great open promenade deck, a teak floored porch 60 feet wide and over 100 feet long broken only by one small hatch cover and at the extreme after end by a small superstructure housing the hospital.

In the smoking room the designer has developed a very fine example of the English Tudor period; and in carrying out this design the craftsmen have produced an outstanding example of the joiner's art. The bulkheads are paneled to ceiling height with primavera (white Colombia mahogany) in a natural finish. All panels have carved wood mouldings and those in the upper row are highly embossed with the crests and seals of more than twenty universities and colleges of the United States, including the University of Hawaii. The columns and pilasters are embossed with a motif of entwining grape vines and hibiscus, representative of the horticulture of both California and Hawaii. The overhead beams also are richly carved and embossed, while a touch of color on the crests and in the art glass windows greatly enhances the pleasing effect of complete harmony in design, craftsmanship, and finish. The woodwork in this room and in the tea room adjoining was manufactured and installed complete by the Commercial Fixture Company of Los Angeles.

All hangings and drapes in the smoking room are in sage green tone and the chairs and other seats are in green leather upholstery.

The tea room, opening off the smoking room through wide archways, carries out the same period motif in the verandah type with hand blocked linen drapes and Coronado crash upholstery on alcove seats and chairs. An A deck pantry and a soda fountain with dumb waiter service from C deck serve refreshments to smoking room, tea room, and garden lounge, which latter is simply an open verandah on the after end of the verandah tea room. This arrangement of rooms and open deck space is equal in appointment, appearance, and spaciousness to anything we have seen afloat. Walking forward from the open deck into these rooms, the vista effect is heightened by the ornamental railing across the well for a double stair at the forward end of the smoking room and by the large art glass grille which is set in the paneling above the stair landing, giving the appearance of a large leaded window on that end of the room.

Public Rooms, B Deck

Public rooms on B deck include the writing room and rotunda foyer forward, the lobby and office amidships, and the library aft. The writing room and rotunda foyer are formed by an enlargement of the fore and aft passageways and their principal decorative features are the rotunda and grand double-circular stairway already described. The writing desks are arranged around the periphery of the "clear story" of relieved ceiling in the dining saloon. The color scheme is based on French grey and the drapes and furnishings are all of the Adam period style. Especially designed lighting fixtures are mounted on each writing desk.

The library aft on this deck is unique in that it is so widely separated from all other public rooms on the vessel and gives, to those who love a quiet nook and a good book, an opportunity to enjoy these pleasures undisturbed. The room is paneled in mahogany and the color scheme as carried out in drapes and upholstery is in Du Barry rose and grey.

C Deck

The grand stairway opens on C deck directly onto the foyer entrance to the first class dining saloon under the rotunda well. This foyer is broken by the six graceful pillars supporting the rotunda, the two forward pillars forming a frame for the great dining saloon doorway. In the center of the deck space enclosed by these columns and directly under the rotunda sky light is a special design, worked out in the tiled floor, showing a group of Hawaiians in an outrigger canoe with the rising sun back of them. One figure is standing with arms out-stretched in welcome. The inscription of this interesting medallion reads: "Kipa Aloha I Hawaii," which, freely translated, means "Hawaii extends a hearty welcome to all the world." The floor is in marbelized black and white rubber tile, especially designed for this ship and supplied and installed by the Goodrich Rubber Company. The foyer is finished in grey with elaborate mirror effects, and under the soft colored light the black and white medallion takes on a rosy glow of life.

Entering the dining saloon we are confronted with a vista of great depth. A clear lane amidships, with no tables on the center line, leads to a beautifully designed and executed Grecian fountain at the forward end of the room. The actual distance from the door to the fountain is only 72 feet, the effect of distance, however, is skillfully enhanced by the designer through the impression given by the Grecian columns surrounding the central lofty hall of this room, so that, from the door, the fountain appears to be located at nearly twice its actual distance from the observer.

The central pillared hall of the dining saloon is carried up to A deck, giving great ceiling height and allowing some beautiful architectural effects. The period motif for the entire room is Grecian. The basic color is ivory with extensive use of relief ornamentation pointed in Grecian blue and gold. Twelve massive square columns extend up to the lower side of A deck, forming a lofty central hall effect, of which the ceiling height is two full tween deck spaces. Between these columns above the B deck level there has been installed a very interesting series of colored art glass windows, featuring historical and mythological subjects connected in a general way with the maritime history of various nations and forming a colorful frieze. There are eighteen of these windows, the subjects depicted in order being: Norway, China, Ireland, the Hebrews, Poseidon, Egypt, Phoenicia, Rome, France, on the port side, and on the starboard side, Hawaii, Britain, the Pirates, Spain, Santa Maria Regina de Los Angeles, United States, Ponce de Leon, Italia, Hawaii. These windows, and the others already described were designed especially for the City of Honolulu by Carlton M. Winslow and executed by the Judson Studios, Incorporated, of Los Angeles.

On the after end of this clear story ceiling well there is an imposing panel, illustrating the legend of Odysseus and the Sirens, with Butcher and Lang's translation of the Siren's song. Above are three large ceiling lights, the center light featuring the emblem and seal of the Los Angeles Steamship Company worked out in color; the forward light, the coat of arms and seal of the City of Los Angeles, the ship's home port; and the after light, the seal of the City of Honolulu, its port of destination. At the forward end is a nicely designed balcony for the orchestra.

This grand dining saloon is furnished with round tables seating six and eight and with small oblong tables seating two, and will comfortably take care of over 300 at one seating. Galley and pantries are located just aft of the dining saloon on the port side and are arranged with wide double entrances and exit passageways for prompt service. The galley is equipped with Ray ranges and the pantries with a complete installation of electrical equipment. Toasters, egg boilers, coffee urns, pancake griddles, waffle irons, slicing machines, mixing machines, and many other varieties will insure good eats getting to the table in prime condition to serve good appetites. The Cass Manufacturing Company of Los Angeles supplied and installed the galley equipment.

An interesting feature in the galley and pantry is the very attractive floor of small, dark red, nonskid tiling, laid with shallow gutters in black cement. This tile, an imported product, was supplied and installed by the Bruner Marble and Tile Company of Los Angeles.

Butcher shop and bakery are on D deck, directly below the galley on C deck and connected by dumb waiter service. Large ice box capacity is installed. Three York refrigerating units give ample refrigerating capacity to take care of the refrigerated food and cargo spaces, which have a combined capacity of over 500 tons.

Swimming Pool

Perhaps the most unusual feature on the new City of Honolulu is the Pompeian swimming bath on E deck.

This plunge tank is 23 by 33 feet, finished in glazed tile and surounded by a classic Pompeian collonade, outboard and fore and aft of which are arranged the dressing rooms, hand ball court, steam and massage rooms, showers, special treatment rooms. The tiling was supplied and installed by the Bruner Marble & Tile Co., Los Angeles. This is, we believe, the first installation of its kind at a Pacific Coast yard and it is finer than anything of the kind that we have seen on any of the visiting round-the-world liners.

Many details of construction and operation on the City of Honolulu have been worked out in rather unique and interesting ways to insure maximum comfort and convenience for the passengers.

Every state room has outside air exposure as well as mechanical ventilation.

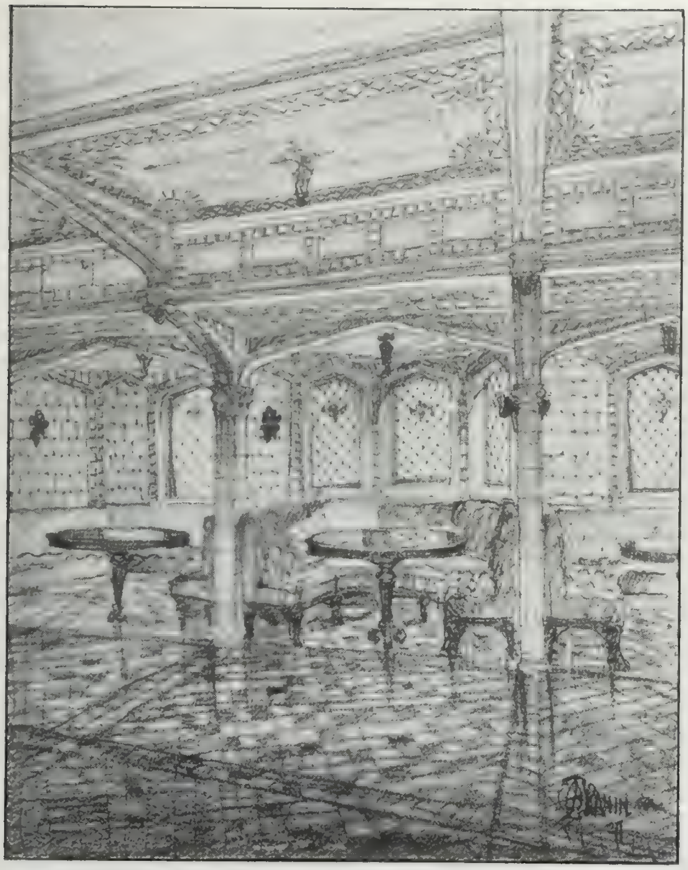
Nearly all cargo is handled through side ports and distributed laterally and vertically through the tween deck hold spaces on a Matthews type conveyor designed especially for the job by Mailler Searles, Inc., of San Francisco, in conjunction with Pillsbury and Curtis, the former working through their Los Angeles representatives.

SMOKING ROOM.

This illustration is made from the architect's drawing depicting the vista looking forward from the tea room into the smoking room. These rooms are finished in the English Tudor period motif. Richly paneled in primavera, with hangings and upholstery in sage green tones, the smoking room is a very charming example of the old English interior.

The large art glass window effect at the end of the room is on the landing of the double stairway leading to C deck.

An interesting feature of the smoking room decoration are the panels above the windows carved in high relief to represent the coat of arms of many of the world's famous universities.



TEA ROOM.

Built in verandah style, old Tudor motif, the tea room, with its hand blocked linen drapes and Coronado crash upholstery presents an excellent opportunity for the working out of delightful nooks in alcove seatings. This tea room opens out through the garden lounge aft onto the finest open deck space we have yet seen on board ship, a clear teak floored porch 100 feet long by 60 feet wide.

All passageways are ventilated both naturally and by means of power fans.

All staterooms are equipped with hot and cold running water. In nearly all staterooms with communicating baths a wash basin is provided in the stateroom as well as in the bath room. All plumbing fittings are solid cast white metal of heavy section similar to the type designed for the Leviathan. Eleven miles of piping were put into this plumbing system.

All staterooms have telephones installed and a complete intercommunicating central station switch board system connects with all rooms. Twenty-five miles of wire was needed to make this installation. Arrangements are made for plugging into the shoreside system when at dock.

The electric lighting system is very elaborate and complete. Many of the fixtures were designed for this job by Schweitzer-Alexander, Inc., of Los Angeles. Both direct and semi-indirect lighting system are used in the public rooms. It is reported that 75 miles of electric wiring were installed in completing the lighting system on this ship.

All staterooms and public rooms are equipped for steam heat.

All public rooms are assured of a definite supply of fresh air through an elaborate system for both supply and suction. In working out this system, the large columns in way of the music room, writing room, dining saloon, D deck lounge, and swimming pool are used as ducts for supply and suction. The ceiling lights in all public rooms are equipped with grilles, through which warm air may be drawn off. Thirty-five Ilg Universal blowers, driven by electric motors, were in-

SWIMMING POOL.

As shown in the architect's drawing below, the swimming pool on the City of Honolulu is carried out in strictly Pompeian motif. This pool, 23 feet wide and 30 feet long, is surrounded by a wide marble collonade, alongside of which are enclosed the dressing rooms, massage treatment rooms, steam rooms, and handball court. This is the first built-in swimming pool installed on a passenger boat on the Pacific Coast, and is as fine as any we have seen. It is reached by elevator service from A, B, C and D decks as well as by the grand circular stairway. This feature of the passenger accommodations of the liner City of Honolulu will undoubtedly be very popular with her passenger list.

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stalled to operate this system by the Illinois Electric Company of Los Angeles.

An automatic electric elevator provides easy access from E to all decks above, up to and including A deck. This lift was installed by the Baker Iron Works of Los Angeles.

All crockery, dishes, and table ware were especially selected for this ship and some pieces especially designed. Chinaware was supplied through Parmelee-Dohrmann Company and crockery through H. G. Mellon and Company, both of Los Angeles.

Machinery

The power plant of the City of Honolulu consists of eight Babcock and Wilcox water-tube boilers burning fuel oil on the Babcock and Wilcox system and arranged for forced draft. Each boiler is supplied with forced draft through its own motor driven Sturtevant blower. These boilers supply steam at 250 pounds pressure to a pair of quadruple expansion engines with cylinder 27¼ by 40 by 57½ by 82¾ inches, by 55-inch stroke. Running at 82 revolutions a minute, these engines deliver 11,000 shaft horsepower to the twin screws. On her builder's official trial recently, the City of Honolulu made a maximum speed of 16.94 knots and an average of about 16.5; so that she has ample reserve to maintain her schedule, which calls for a little under 16 knots.

All the steam and other piping in engine and boiler rooms is made from extra heavy seamless drawn steel or copper tubing and all joints are made with steel flanges cut from boiler plate. The tubing is expanded into the bore of the flange, thus making a tight metal-to-metal fit without the use of threads. This method practically eliminates leaky pipe joints in the engine room. The Pacific Copper and Brass Works, Inc., of Los Angeles, furnished all brass, bronze, and aluminum castings, special brass fittings, valves, and copper pipe.

All steel castings were supplied by the Warman Steel Castings Company of Los Angeles.

Four Wheeler Radojets assist the main condensate pumps in maintaining a vacuum on the condenser. These Radojets are arranged so as to draw from four compartments in each condenser, each jet having a double suction. This arrangement insures maximum use of cooling surface of condenser tubes and greatly increases effectiveness of the condensing space. The condensers are equipped with the famous Blackskin tubes furnished by the British American Tube Company, Inc., through Oliver B. Lyman of San Francisco.

Nearly all auxiliaries are electrically operated, power being supplied from four General Electric steam engine driven electric generating sets. The power wiring for electrically operated machinery measures over twenty miles.

Main feed pumps, ballast pump, fire and sanitary pump, bilge pump, and cold fresh water pumps are all Worthington. Wm. E. Quimby pumps driven by Westinghouse motors take care of fuel oil service requirements.

Organization Back of the Ship

Much credit is due the Los Angeles Steamship Company for the high standard of passenger service maintained during the expansion of their transportation facilities.

General M. H. Sherman, president of the company, while practically retired from active participation in the management, has taken a keen personal interest in the development of the steamship City of Honolulu and in all plans for the improvement of organization and of service.

Ralph J. Chandler, vice-president and general manager, is principally responsible for the building up of a fine organization and the development of a real passenger steamship business. He planned and established the Los Angeles-Honolulu service of the company and has performed splendid work in the maintenance of and additions to the fleet of ships. Under his able management there has been built up an excellent organization for promoting passenger business. Mr. Chandler is ably assisted by George Crofut, who is always on the job supervising all details and all purchases.

Roy V. Crowder, passenger traffic manager, is probably as well known as any man in his line in the United States. During the past five years he has established friendly and effective connections in every ticket office in every large town and city in the United States. In so doing he has succeeded in imparting to the men selling tickets such a thorough understanding of the ship schedules and rates of the Los Angeles Steamship Company that this information is always primarily available to any prospective steamship traveler.

Robert F. Cullen, general passenger agent, is also very well known in passenger steamship circles, having had twenty years' experience in this line at Los An-

Period Lighting Fixtures

Among the many factors involved in the completion of the interior decorations of the City of Honolulu, not the least important is the design and installation of electric lighting fixtures. Both direct and indirect lighting systems are used, and many of the fixtures are of special design to carry out the period motifs dominating the treatment of public rooms and suite interiors.

The graceful Grecian incense burner design shown herewith is that of the indirect lighting floor lamps which grace the corners of the great central hall of the Grecian dining saloon.

The lighting of the steamship City of Honolulu was planned and executed by Schweitzer-Alexander, Inc., of Los Angeles.

MAIN TICKET OFFICE, LOS ANGELES STEAMSHIP CO.

The Los Angeles Steamship Company passenger department is very justly proud of their uptown ticket office in Los Angeles at 730 South Broadway. Every employee in this office is furnished with his own telephone connecting with the private exchange at the office of the general ticket agent on the balcony in the rear. Every employee has his or her private locker. There is plenty of fresh air and light, the walls are decorated with very fine colored panels depicting the beauties of Hawaii and southern California. The floor is covered with Goodrich marbleized rubber tiling, which harmonizes beautifully with the softly colored stippled stucco of the walls. General Passenger Agent Robert F. Cullen is chiefly responsible for the planning of this office.

geles. Mr. Cullen planned the new passenger ticket office at Los Angeles, which is said to be in many respects superior to anything in this country. S. (Steve) Lindo, a chief engineer of many years' experience afloat, has charge of the floating equipment maintenance, and, as marine superintendent, is on the job early and late. His motto is "Nothing Impossible" and he always attacks the most puzzling problems with the brightest smile.

The members of this organization are very proud of their fine new passenger liner, the City of Honolulu, for they feel that this vessel, whose passenger accommodations are most beautiful, most luxurious, and most comfortable, whose splendid dining saloon and galley provide a cuisine equal to that of our finest hotels, and whose wide promenades, open deck spaces, and wonderfully ventilated public rooms insure comfortably cool relaxation and enjoyment in the tropics, is the embodiment of their efforts covering many years of wise planning and hard labor and symbolizes the high character and the successful quality of their service.

The Front Door of America

SCANNING the economic horizon of the Pacific Coast, Harry Chandler, vice-president and general manager of the Los Angeles Steamship Company, made the prophecy at the general session of the Chamber of Commerce of the United States that the time will come when that region will be the front door of America's commerce.

"Forces," he said, "beyond our power to control or to direct are setting the stage on the shores of the Pacific of a new theater of world events. The centuries-westward march of Aryan achievement has ushered in what for want of a better term may be called the Pacific Era. The front door of America will ultimately be on the Pacific, whose eastern and western shores are formed by lands just coming into the world's spotlight in its onward sweep from East to West.

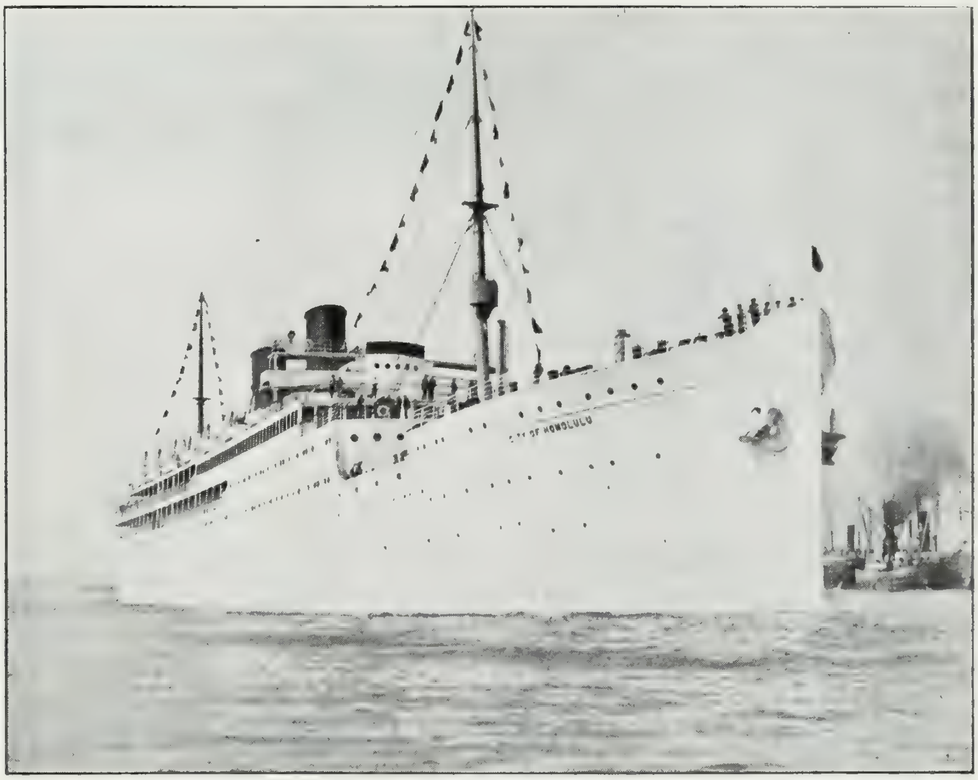
Over the rim of the Pacific half the population of the earth is stirring from a dormancy of centuries and moving forward toward modern standards of living. Our trade with Asia in the twelve months of 1926 equalled the total foreign commerce of the whole United States in 1900. What this commerce will become with the modernization of the Orient's hundreds of millions and the development of her immense resources can only be conjectured. Through the Pacific ports America will supply the multitudinous and varied wants of the waking nations of the new Far East as western Europe supplied the wants of eastern America during the latter's early development—and with similar commercial results."

HER MATE.

The new passenger liner City of Honolulu is to be a running mate on the Los Angeles-Honolulu service for the passenger liner City of Los Angeles. These vessels, together with the Calawaii, will maintain services three Saturdays out of every four, regularly between Los Angeles, Honolulu, and Hilo. This service has become increasingly popular, particularly in regard to the three-week tours, which have been instituted by the Los Angeles Steamship Company and which are available at very reasonable rates covering all expenses to, from, and at the Islands.

The New Passenger Liner City of Honolulu

Pillsbury and Curtis of San Francisco and the Los Angeles Steamship Company have produced in the passenger liner, City of Honolulu, a very trim, shipshape, beautiful sea boat. The rake of funnel and mast, the wide open and enclosed promenade spaces, and the yacht-like lines of her stern and counter combine to give to this steamer that air of being a thing of life which is so dear to the heart of the lover of the sea.



The New Nelseco Diesel Engine

Mechanical Injection Diesel-Electric Power Plants Great Success in New York Harbor Tugs and New York-Weehauken Ferryboats

The engine room of the New York ferryboat Governor Moore showing the two 350-horsepower Nelseco MI diesel generating sets.

SOMETIME ago I was sent out on a job to test out twelve new engines. At the present time half of the job is running and making money for the owners and by the time this gets by the editor's waste basket (provided it has that good luck) the rest of the twelve will be at their labor.

Some of the jobs that a test and trouble engineer has to go out on are real problems, but this job has been so successful that it has proved to be a real picnic. This flock of engines that I have been hinting at are the 350 B.H.P. Mechanical Injection Nelseco diesel engines in the new ferry boats for the Electric Ferries, Inc., of New York. There are six boats, regular double end steel ferryboats and built by the American Brown Boveri Electric Corporation of Camden, N.J.

While they are regular ferryboats, they are modern to the last word. Two 350 H.P. diesel generator sets and the 580 H.P. double armature propelling motor, coupled directly to a continuous propeller shaft with a propeller wheel on both ends, makes up one of the finest sets of propelling machinery I have ever been shipmates with.

The control system allows for either pilot house or engine room control by simply throwing over one switch.

I have been mixed up with oil engines ever since I used to run around the Kennebec River down in Maine, looking for motor boats in trouble and fixing them up for the benefit of all concerned. You understand I had a motor boat to run around in, I did not run on the water. Even though gasoline engineers could easily have been credited with being that crazy at that early state of the game.

The New London Ship & Engine Co. have been building diesel engines since 1911 and while their air injection engines were as good or better than most of the diesels on the market, there never has been anything built, in my opinion, to compare with the mechanical injection engines that they are building now.

About two or three years ago, after five or more years of experimenting, the first 3 cylinder, 4 cycle, 150 H.P. generator engine was completed. This engine was tested, re-tested and some more tests and after everyone failed to wreck it, it was turned over to the tender mercies of the power house crew and run for shop power. This engine was especially used to carry the load from 4:15 p.m. until morning and from Saturday noon to Monday morning. The power house engineers had such faith in it that it is rumored that they used to get a good night's sleep and the little 3 MI. kept right on lighting the works.

The next engine was a 300 H.P., 6 MIR-18 for the tug Hugh O'Donnell. This engine was completed and installed in the spring of 1925 and has been going ever since and has proved that with a good reversible diesel engine the engineer can answer bells just a little bit faster than a New York Harbor Captain can ring them down. You know the story of the engineer that used to work ahead and astern for half an hour after the boat was tied up, to catch up to where the Captain left off ringing. This has all been done away with now, the same as taking three years with a shovel to learn to run a steam engine.

The first and second ferryboats, Governor Moore and C. W. Culkins, respectively, were launched on October 21st, 1926, scarcely four months from the date of laying the keels. On the evening of the 21st we had both engines in the Moore running at the dock, and on the 23rd, put both engines on a 24 hour dock trial. At the end of that run they were both kept going to furnish juice for steering gear tests, maneuvering tests, auxiliary machinery tests, and as far as I can figure from my records, they have been going most of the time ever since, Sundays and Thanksgiving day included. The river trials were run on October 26th and the boat made the 250 mile run to New York, leaving Camden Oct. 31st.

On October 28th the engines in C. W. Culkins were started up and the boat was delivered in New York, Nov. 5th. On Nov. 8th, just 18 days from the launching date, both boats began the run from 23rd Street, New York, to Weehawken on a 15 minute schedule, 18 hours a day, and to date there has not been one minute's tie up due to engine trouble.

Now this speaks pretty well for a new design electric drive ferryboat job, but we beat all records on the third boat, the Grenvill Kane. This one was launched Nov. 17th, started up main engine Friday, Nov. 19th—dock trial Saturday, sea trial on Monday—left for New York

Tuesday, arrived Wednesday and put the boat on the run that same afternoon. Since that date two boats have been operating 18 hours a day and the third boat comes on during the rush hour, giving 10 minutes service from a single slip on each side of the river.

Something that I believe never was done before in New York Harbor. Practically all the bus lines that can do so are using this express service and are displaying a sign "We Use the New Electric Ferries—No Delays."

One day recently I tried to figure out how much it was costing for fuel and oil to operate and the saving over a steam job. About as close as I could get to it was that one "Arrow line bus" an hour would pay the fuel and oil bill and 13 cents to the good. Running four trips an hour, and some trips carrying five buses, twelve trucks and 23 flivvers—I guess I had better get down below where I belong and look at the exhaust temperature.

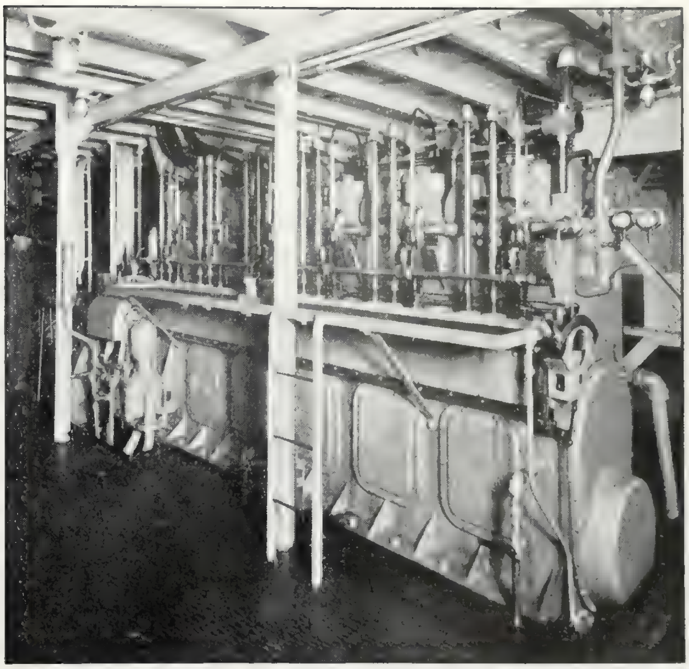
These engines are built for 350 H.P. each and are guaranteed to stand up to 15 per cent overload for an indefinite period. So far so good, but on the reversing tests I have seen a pair of engines in series with the propelling motor, settle down and pull over 1000 H.P. until the boat's headway was checked and got in motion astern. You can figure it out for yourself what percentage of overhead is 1000 H.P. from 700 H.P. in engines.

Back in the early days of airless injection diesel engines we used to speak of everything that did not use air to inject the fuel as hot bulb and solid injection. Some of them sure were hot ones and put the fuel in solid, judging from the noise when the fuel used to butt up against the piston at the critical moment. This condition has all been done away with in the late type Nelseco MI and in air starting one can hardly tell where air start leaves off and fuel begins. On the reversing tests of the trawler Boston 350 H.P. MIR type, I actually got 78 air starts from one 5 cu. ft. air bottle, beginning with 700 lbs. of air and finishing up down around 100 lbs.

As we have had such good luck starting up the first six engines on this ferryboat job, and for the benefit of the engineers who may have the pleasure of starting up some new ones in the future, I am going to tell about the simple little system I use and so far every engine on this particular job has started the first time. Just a minute until I knock on wood.

The first move is to try out all the valves on the water system, run a little water through the engine from the auxiliary pump and be sure you see it come through the outlet on the side of the ship. Open up the lubrication oil line where it goes into the pressure system, run through a bucket full of oil, hook it up and start the hand pump, and circulate lubrication oil while the fuel lines are being filled with clean fuel. Work the fuel pumps by hand and prime up the lines to the atomizer tips. Take the bonnet off the air starting stop valve on the engine and blow out the line good with air from all bottles.

It is surprising the amount of chips, cigarette stubs, and other foreign matter that will come out of an air line. Put in the jacking gear and turn over, by hand, two or three times. Take out the jacking gear. Blow off the heads with an air hose, oil up all the valve gear—give all the exhaust and inlet valves a push by hand to see that they are free.



One of the 350-horsepower Nelseco MI engines on the New York ferryboats.

Now make another little check up on the piping and valves. Everybody stand clear, give her the air, roll over a few times on air, then open the throttle slow and there you are, another new engine running like an "old timer." Run 15 minutes, shut down, feel bearings. All O.K., put her on the dock trial, and the ship yard crew can handle her now. On these first three ferryboats there has never been over three hours spent on a pair of engines tuning them up for the dock trials. Dock and sea trials are supposed to be a kind of a "wreck 'em if you can" party.

So far on the first three boats everything on the whole job has been capable of doing a little more than the specifications called for. I feel that the American Brown Boveri Electric Corp. deserve a lot of credit for a quick job done well. Also Mr. Eads Johnson, the designer, but diesel driven ferryboats are one of his special successes.

World Shipbuilding

A comprehensive memorandum on **Shipbuilding** has been issued as part of the documentation of the International Economic Conference, which began its sessions at Geneva on May 4. The document was prepared by the Economic and Financial Section of the League of Nations from information furnished to it by governments, by members of the Preparatory Committee for the Conference, and by industrial organizations, which prepared memoranda at the request of members of the committee.

The salient phases of the subject and its international aspects are examined from this mass of information, and the statistical tables and summaries, as a consequence, are the most comprehensive, authentic, and up-to-date available.

The memorandum is obtainable from the American agent for publications of the League of Nations, World Peace Foundation, 40 Mt. Vernon Street, Boston. Price 40 cents.

This memorandum shows, in a very striking way, the fact that American shipbuilding is at a very low ebb and badly needs a stimulant if it is to survive.

An Interesting Design of 65-Foot Steel Tug For Geared Diesel Drive

By Renwick Z. Dickie

PROBABLY the most severe criticisms leveled against a diesel engine for marine work has been relative to its low propeller efficiency when directly connected. The average loss of efficiency, according to most propeller designers, is placed at over 30 per cent.

However, the advent of the famous Foos "Type L" full diesel engine, driving a propeller through reduction gears has made possible the use of propeller efficiences up to a point equal to that of a steam plant, it now being possible to turn the most efficient sized propeller at slow speed without any appreciable loss of the actual brake horsepower delivered through the reduction gears to the wheel. The delivery of diesel power to the propeller in this manner means also that the impulses of the propeller torque are divided by the gear ratio, thereby practically equalling the torque of steam propulsion.

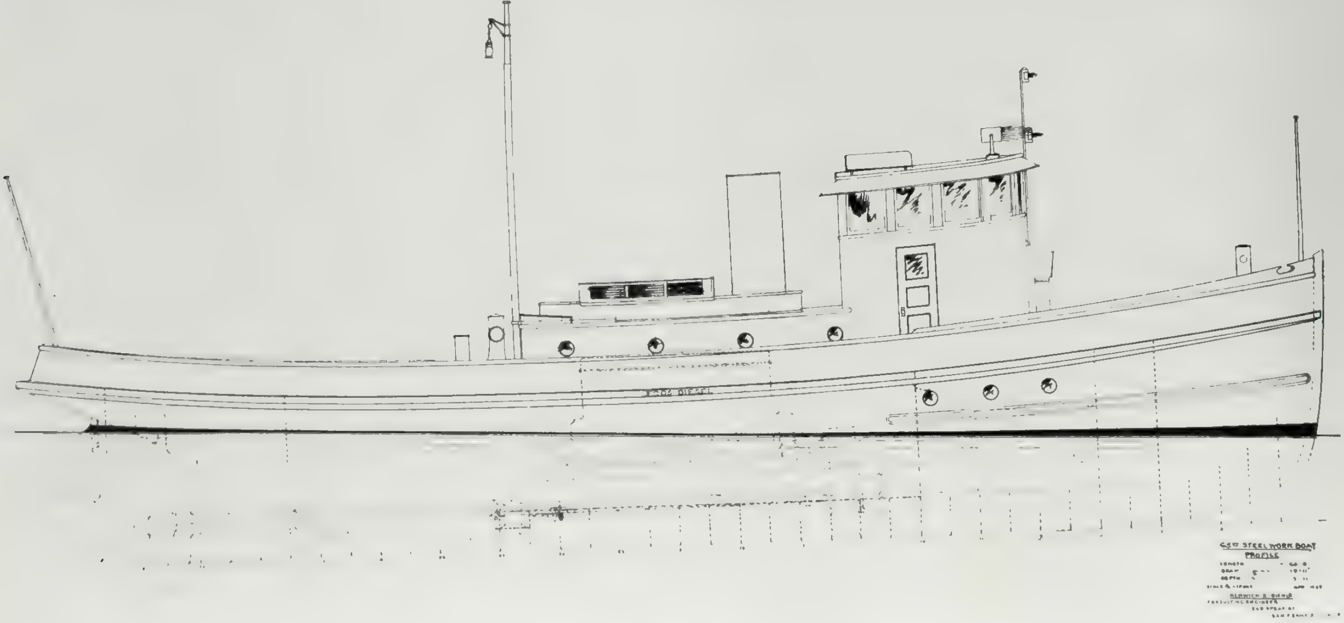
A close study of this important development will reveal remarkable possibilities, and in fact revolutionary steps forward with diesel marine propulsion.

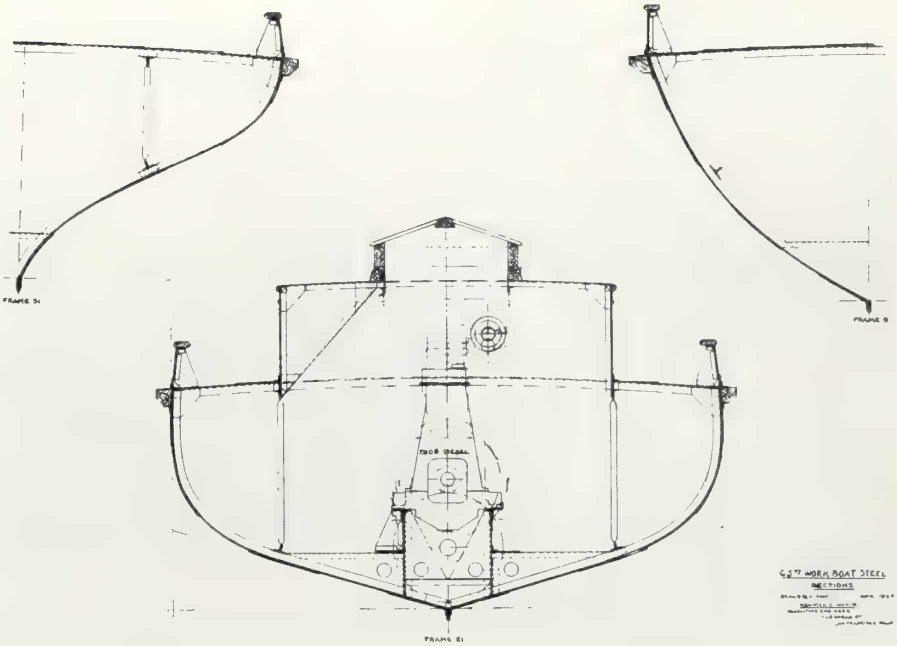
For instance, a Foos diesel reduction geared tug is now being designed for San Francisco Bay, 65ft. by 19ft. by 7ft., which is capable of efficiently using 400 horsepower. In the particular instance referred to, however, 250 horsepower is all that is required. This power is transmitted through reduction gears to a 7 by 8-foot propeller turning at 150 revolutions per minute, the entire control being in the pilot house and operated by one man. This tug will be of steel in order to care for severe hull strains when towing, and it is interesting to note that the stern post, while possessing great strength, is only 3 inches in width, thus allowing free passage of water

Comparative Capital Investment and Operating Costs of Typical Towboats

	250 H. P. Steam Tug		250 H. P. Heavyweight Diesel Tug		250 H. P. Foos Diesel Reduction Geared Tug Direct Reversible (with Pilot House Control)	
Type of hull	Wood		Wood		Steel	
Dimensions	78'x19'x9'		74'x18'x8'		65'x19'x7'	
Cost of hull	$20,000.00		$19,000.00		$15,000.00	
Cost of Engine	$24,000.00		$20,000.00		$14,750.00	
Total cost	$44,000.00		$39,000.00		$29,750.00	
Weight of engine	50 Tons		19 Tons		12 Tons	
Diameter and pitch of propeller	7'x10'		5'6"x4'		7'x8'	
R.P.M. of propeller	135		275		150	
Number of blades	4		3		4	
Speed running free	11½ M.P.H.		12 M.P.H.		13-14 M.P.H.	
Average fuel capacity	3 days		14 days		21 days	
Cost of fuel and lubricating oil:						
Per hour	$ 1.27		$ .75		$ .65	
Per day 8 hours	10.16		6.00		5.20	
Per month 25 days		$ 254.00		$150.00		$130.00
Crew required		(5)		(4)		(2)
Captain	$275.00		$225.00		$175.00	
Chief Engineer	185.00		200.00		——	
Deck Hand	90.00		180.00 (for 2)		90.00	
Fireman	90.00		——		——	
Cook	90.00		——		——	
Wages per month		$730.00		$605.00		$265.00
Meals:			12 at 75c		6 at 75c	
Per day 15 at 75c	11.25		9.00		4.50	
Per month	25	$281.25	25	$225.00	25	$112.50
Totals per month		$1265.25		$1050.00		$507.50

To recapitulate, this new design for a steel tug will cost 20 per cent less to build and will make a saving of 50 per cent in operating expenses.





to the propeller. The towing power, notwithstanding the fact that it is of 250 horsepower only, will equal the towing power of a direct-connected heavy weight diesel of 350 horsepower. Furthermore, this tug can speed 13 miles per hour when running free. When desired for excursion purposes, it can be arranged to carry at least one hundred passengers.

The same proportionate figures apply to fishing boats, steam schooners, or any other type of craft, and no doubt there will be tremendous enthusiasm displayed when the advent of this revolutionary accomplishment is fully realized. Not only does it permit of a very much lower capital investment but it also materially reduces operating costs, as is indicated by the table of comparative statistics reproduced herewith, wherein a comparison is given of a 250 horsepower steam tug, a 250 horsepower direct drive heavy weight diesel tug, and the 250 horsepower Foos diesel reduction drive tug.

The very modern construction of the Foos diesel engine, embodying complete counter-balancing, makes it possible, by reason of the consequent lighter weight and higher revolutions (which, however, does not sacrifice strength) to build a fairly shallow boat, yet to equip her with the large propeller which puts her in the class of the steam tug when in deep water, while, owing to her comparative light draft she can work in fairly shallow water, inasmuch as her hull draws only 6½ feet. While a great saving in weight has been accomplished, it has not been done at the cost of sturdiness. This job is so built that the actual engine stresses and strains are less than with direct drive. Furthermore, the maneuvering ability of this tug is far beyond the possibilities of any direct drive diesel tug, inasmuch as the reduction gear permits the propeller to be moved in either direction for the shortest possible period at the will of the pilot house operator.

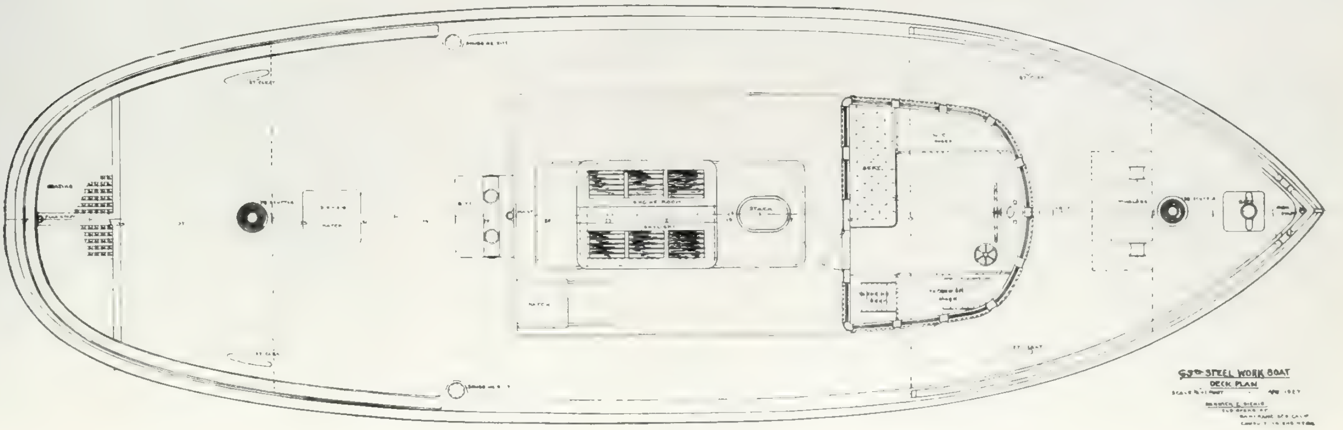
It is interesting to note that one New York tug boat concern meets an annual damage bill of $750,000, most of which could be eliminated by the ability to maneuver more quickly and safely. This accomplishment is just one of the features of the new Foos reduction gear equipment. In short, this combination has all of the advantages of steam, diesel-electric, or direct-connected heavy weight diesel propulsion without any of the disadvantages, in addition to which it is far cheaper in its first cost as well as in its operating expense.

Conversion of hulls now in service can be effected with the consequent tremendous savings already referred to, and greater towing power and speed can be attained with lower priced engines of less rated horsepower than those now being used.

Not only is the operation of the Foos reduction gear automatic, but the diesel engine itself is a revelation in simplicity. Nowhere can an oil can or grease cup be used and the engine is entirely enclosed. Being counter-balanced with overhead cam shaft and dual valves, it performs noiselessly and without vibration. Cylinder liner construction is used, and individual fuel pump for each cylinder is another special feature, together with Foos patented automatic solid injection. The accessibility of the Foos diesel is remarkable inasmuch as it is possible to quickly remove any vital part of the engine without disturbing another vital part. For instance, the head can be quickly taken off and piston, piston rod, and cylinder liner removed without interference with any other part or without even removing the manifold. There is no packing used throughout the engine and all joints are "ground fits." The operator of a Foos diesel engine is not annoyed with petty adjustments and other unnecessary things to do.

Of extreme importance to marine

(Continued on Pgae 26, Advertising Section)



Pacific Workboats and Their Power Plants

Delta Boatyard Notes

THE building of fast skipjack type of craft with out-board motors is becoming quite a business. One of the larger boat building yards at Stockton, California, formerly devoted to workboats and barges, the **Colberg Boat Works,** is making arrangements for stock production of these light but speedy vessels. Forms and molds are being made to give easy and rapid output of boats 14 feet long by 44 inches beam. The draft is negligible, as they are of the "one step" type, and built to slide over the water rather than to go through it. The completed hull weighs less than 100 pounds. The motors will be of the Johnson type, weighing, in the case of the larger sizes, 60 pounds. With this stock machine of 11.16 horsepower, a speed of 26½ miles an hour has been attained.

This yard is just completing a new hull for the Stockton Transportation Company, which will be used as a freighter on the Delta waters, taking the place of the old Service. The craft is 65 feet length, 22 feet beam, and 6 feet 6 inches depth. She will be powered with the engine from the first Service. This latter will take a new name, and have installed a 120 horsepower reversible full diesel by Fairbanks, Morse & Co.

The Colberg yard has recently installed a 40-horsepower, 4-cylinder diesel of the new design by Fairbanks-Morse in their passenger boat William C. This replaced a gas engine and is giving great satisfaction. Under full speed on long runs this engine operates on a fuel expense of 8 cents an hour, or less than one-tenth the cost of the gasoline engine it replaced.

Stephens Brothers of Stockton, builders of cruisers and yachts, are very busy. They have just completed a full staysail rigged sailer for R. H. Goodale of Berkeley. She is 62 feet in length by 13 feet beam, with a draft of 7 feet, has three lower sails, and a fisherman's staysail, all set from inboard and handled from the cockpit. There are comfortable quarters with accommodations for sleeping seven, with a big galley and all conveniences. Teak and other hardwoods were used liberally, giving an elegant appearance.

Officers of the Bay and River Boat Owners Association. Left to right, Captain Benjamin Walters, president; William McCauley, director; Charles Crandall, secretary; and Directors Elmer Gormsen and R. H. Vehmeyer.

The new yacht is named Tamalmar and she will be a fine addition to the fleet of yachts on the Coast. A kicker engine of the F-4-Scripps build, of 4 cylinders and 40 horsepower, gives her a speed of 9 miles without sail. A duplicate of the hull is under construction for S. F. B. Morse, president of the Del Monte Properties, but she will have a Frisbie 4-cylinder, 25-horsepower engine, relying more on sail than engine power.

Besides these two larger craft there were nine other boats in various stages of construction in these sheds.

George W. Ingersoll at Weber Point, Stockton, has been building inland waterways craft for the past thirty years. Some time back the plant was burned, but has now been rebuilt. This yard features barges for the most part, though workboats are constructed, as well as other craft. A serviceable ways for hauling out small vessels and efficient mill facilities are available here.

The repair plant of the **Island Transportation Company,** Stockton, is kept busy, as a rule, on the upkeep of its own fleet of barges and workboats. Twenty men, on an average, are employed at this work, as the many hulls and engines need constant attention. A completely equipped machine, blacksmith, woodworking, and pipe shop facilitates these repairs. Several ways for hauling out vessels are a part of the plant and are sometimes used by private operators.

The Harbor Tug and Barge Company of San Francisco has the contract to handle the pipe for the East Bay Municipal Utility District's big pipe line that is to bring water down from the Sierra Nevada Mountains east of Stockton to the East Bay cities. This pipe will be loaded on barges at Oakland and towed to Stockton. To accommodate the landing, a new wharf is being constructed at Colberg Bros. boatyard, and a street is being cut through, so that motor trucks can reach the wharf. A crane with a long boom, capable of 2-ton lifts, will be installed on the shore side of the wharf, by which the water pipes can be lifted from barges to trucks, facilitating and simplifying the work. Workboats will be a big factor in this contract, as they are in many others.

A meeting of the Board of Directors of the Bay and River Boat Owners' Association was held recently in Stockton, and a resolution was passed offering a reward of one thousand dollars for the conviction of anyone who may offer or accept any rebate on freights or business done by barge and boat operators. The rates are fixed by the Railway Commission and should be adhered to, in the opinion of the Association membership.

The F. W. Fulton Boatyard at Antioch has just launched a workboat for the Fred Christiansen Lighterage Co. of Rio Vista. This vessel is 53 feet length, 14 feet beam, and 4 feet draft. She will have a Western-Enterprise 4-cylinder diesel engine of 165 horsepower, which will give her speed and sturdiness in towing. The work ahead for her is handling a large barge for the Shell Oil Company, a contract for this work having been made by the owner.

Work at the Fulton Yard has been fairly brisk for the past season, with more contracts in sight. To better handle jobs a new woodworking mill has been erected, with all the necessary saws, planers, and boring machines. The ways have been occupied steadily on repair work.

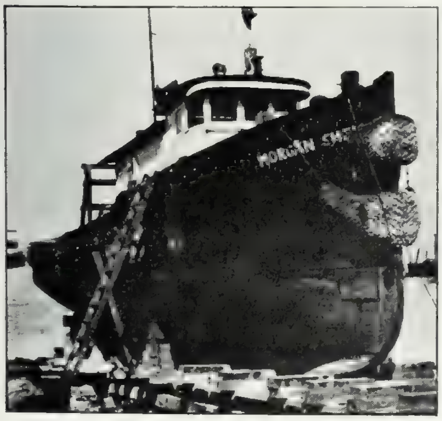
Bundesen & Lauritzen, at Pittsburg, California, have of late done but little in building of workboats, though several repair jobs have kept the yard force busy. Recently they started cutting up the old steamer Pensacola, formerly the German vessel Nivaria. This ship was sold by the government to M. Davidson of Stockton. It is the intention of the owner to scrap and salvage the upper works and then sell the bottom as a barge. She is 339 feet long, of 4211 gross tons, with 1200 horsepower triple expansion engines.

Bay Boatyard Notes

Captain C. T. Pedersen, vice-president and general manager of the Northern Whaling & Trading Co., San Francisco, has just had built by **Geo. W. Kneass Co.,** San Francisco, a special trading workboat, which will be used in Arctic waters to the eastward of Herschell Island at the mouth of the McKenzie river. This craft is 50 feet length by 14 feet beam, with a depth of hold of 6 feet. She is equipped with a 2-cylinder, Atlas-Imperial, 20-horsepower gas engine. For her size she has a most roomy trade hold, the engine being installed well aft, with a raised deckhouse the full length. She will be given Canadian registry when she is unloaded at Herschell Island, now a port of entry.

Captain Pedersen purchased from the Navy Department the old ferry boat Pinafore, so well known at Vallejo, and has had her rebuilt by the Kneass company. She is also for the Northern trade. Her old steam engine has been removed and an Atlas-Imperial 30-horsepower gas engine substituted. Both these craft will be busy handling the big volume of trade this company does with the natives in the Far North.

George W. Kneass Company recently completed a staunchly built workboat with copper bottom. This boat is now en route to an outside port on the East Coast of South America. She is 36 feet long, 9 feet beam, and is fitted with a Standard gas engine of 30 horsepower. So this shows that on the far away shores of eastern South America the operators prefer San Francisco Bay-built and engined workboats.



The workboat Morgan Shell, recently converted from distillate engine drive by the installation of a 180-horsepower Fairbanks-Morse directly reversible diesel engine.

At the yard of **Anderson & Cristofani,** Hunter's Point, San Francisco, the Pacific Cement Company's workboat Morgan Shell has recently had her 75-horsepower distillate engine removed and a 180-horsepower Fairbanks-Morse fully reversible diesel engine installed. This will make her one of the most able boats of her class on San Francisco Bay. The hull was also repaired by the boatyard people.

The offshore fishing boat Ercelia Paladini, which was recently converted from gas engine drive by the installation of a 70-horsepower Atlas-Imperial diesel engine.

One of the fleet of offshore semi-open fishing boats operated by A. Paladini, Inc., of San Francisco, has recently had her gas engine taken out and one of the late model Atlas-Imperial diesel engines of 70 horsepower installed. This was the fishing boat Ercelia Paladini. The fishermen are becoming familiar with the economical diesel engine and its latest simplicities, and many more of these sturdy and reliable motors will no doubt be placed in the small fishing craft.

Boats up at Madden's yard, Sausalito, California.

A queer looking craft has lately been built at the yard of J. H. Madden & Co., Sausalito, California. The deck plan shows a wedge shaped hull, the blunt end forward. She is 16 feet length, with a beam of 9 feet at the bow. Where the cat heads would be on a larger craft are two steel hollow posts, on which are mounted aeroplane engines with the conventional two bladed propellers. These engines are of 120 horsepower each, and big speed is expected when she gets into her stride. The bottom of the vessel being practically flat, she will be practically a hydroplane skimmer. The builder says it is the first of its type ever built.

This yard is building for C. M. Morgensen of San Francisco a 64-foot cruising yacht. She will be 14 foot beam, with a light draft of 3 feet 6 inches. Teak and other hardwoods are used freely in her finishings. Two 180-horsepower Sterling Dolphin engines will give her high speed. Her auxiliary equipment, fully electrical, includes all modern appliances in the matter of easy handling and efficiency. She will be ready for service early this summer.

BRIGGS BITUMEN

Captain J. C. Lapraik of San Francisco reports very good business along the Embarcadero in his various lines of preservatives for ship surfaces.

Captain Lapraik represents the W. A. Briggs Bitumen Co. of Philadelphia, manufacturers of the W. A. Briggs marine glue and the W. A. Briggs bituminous antifouling paint.

In addition to the Briggs line, Captain Lapraik represents the Chipman Chemical Engineering Co., Inc., Bound Brook, N.J.; the Ferrubron Metal Paint Co., Milwaukee; and the Yates-Hulett Paint Co., of San Francisco, as well as the Carbolineum Wood Preserving Co., of Milwaukee.

Fishermen to the Rescue

Purse seiner Duncan No. 1 of the Seashore Packing Co., Seattle, Washington, powered with a 3-cylinder, 75-horsepower Standard oil engine.

The Duncan No. 1, a purse seiner owned by the Seashore Packing Co. covered itself with considerable glory on the night of February 22nd in a thrilling rescue on the Kodiak Island Coast.

Early in February she left Seattle for Alaska fully loaded and went to their cannery on Kodiak Island, and after discharging cargo went back to Kodiak, and was met by the Marshal and Mayor of the town and asked to go out to the rescue of the crew of the halibut schooner Scandia, which had gone ashore and was breaking up in close proximity to a precipitous and rocky beach, where a landing in a small boat could not be made. This rescue was made in the middle of a dark and snowy night, with the wind blowing a terrific gale.

The crew of the Duncan No. 1 did not hesitate, but put their boat into the surf and rescued every member of the crew, and brought them in safely.

This performance is another triumph for the three cylinder direct reversing Standard Oil Engine, demonstrating its reliability in reversing and handling in the most precarious situation.

This boat is one of many purse seiners equipped with the Standard Oil Engine that leave Seattle every year and work in Alaskan waters.

The Duncan No. 1 is 65 feet long, 16 feet beam, 6 feet 2 inches draft, and makes a speed of 9.52 knots per hour.

Bolinders

THE Richard Froboese Company, Pacific Coast representatives of Bolinder's fuel oil engines, reports very satisfactory sales of their product during the past winter, culminating in the installation during May of a 270-horsepower, 4-cylinder, directly reversible Bolinder fuel oil engine in the halibut schooner Dorothy, said to be the largest vessel in the halibut fleet of the Northwest.

The owner of the Dorothy, O. O. Hvatum, had a 160-horsepower, 2-cylinder Bolinder, directly reversible engine installed in 1922 in his schooner Skandia. This vessel sank off Kodiak Island on February 15 last. Her owner was so impressed with the wonderful service that he had had from the engines on the Skandia that he immediately purchased another Bolinder for the Dorothy. During the winter the following installations of Bolinder oil engines were made in the Pacific Northwest:

One 60-horsepower, 2-cylinder engine, equipped with reverse gear in the fishing schooner Summit;

One 70 - horsepower, 2 - cylinder, equipped with reverse gear, in the schooner Sylvia;

One 60 - horsepower, 2 - cylinder, equipped with reverse gear, in the Angelus;

One 90 - horsepower, 2 - cylinder, equipped with reverse gear, in the fishing schooner Betty Jane;

One 150 - horsepower, 2 - cylinder, direct reversible, in the halibut schooner McKinley;

One 150 - horsepower, 2 - cylinder, direct reversible, in the halibut schooner Eldorado;

One 150 - horsepower, 2 - cylinder, direct reversible, in still another halibut schooner, the name of which we do not know, as the boat is still under process of construction.

TELEPHONE SPECIALISTS

IT SHOULD be of interest to all ship operators, naval architects, and shipbuilders desirous of efficiency in the maintenance and installation of ship, dock, and office telephone systems, that a concern specializing distinctly in this line can promise real telephone service. Such a concern is the Electrical Communication Co. of San Francisco. Composed of men formerly connected with the Pacific Telephone and Telegraph Company, whose experience is backed by many years of service, the specialized knowledge of this firm is available to overcome any telephone difficulties with which ship owners may have to cope.

At left, the Sylvia, the 61-ft. fishing boat, powered with a 2-cylinder, 70-horsepower Bolinder fuel oil engine equipped with reversing gear.

At right, the Dorothy, the largest halibut schooner in the Northwest, 103 feet by 21 feet by 10 feet, equipped with a 4-cylinder, 270-horsepower, directly reversible Bolinder fuel oil engine and with a 10-horsepower Bolinder auxiliary engine.

Fuel Conservation Honor Roll

THE Fuel Conservation Committee of the United States Shipping Board Merchant Fleet Corporation announces the adoption of their Honor Roll of Chief Engineers and Masters of the fifty best performing vessels in the Shipping Board Fleet for the six months period, July 1 to December 31, 1926. This is the fifth semi-annual Honor Roll published by the committee. This roll was established as a means of stimulating competition amongst the various Shipping Board vessels, with the view to improving the economy of their performance. The mentioning of a chief engineer and master on this honor roll entitles each one to a bonus of fifty dollars in recognition of his efforts in establishing a sufficiently high record to warrant placing the ship in this banner class.

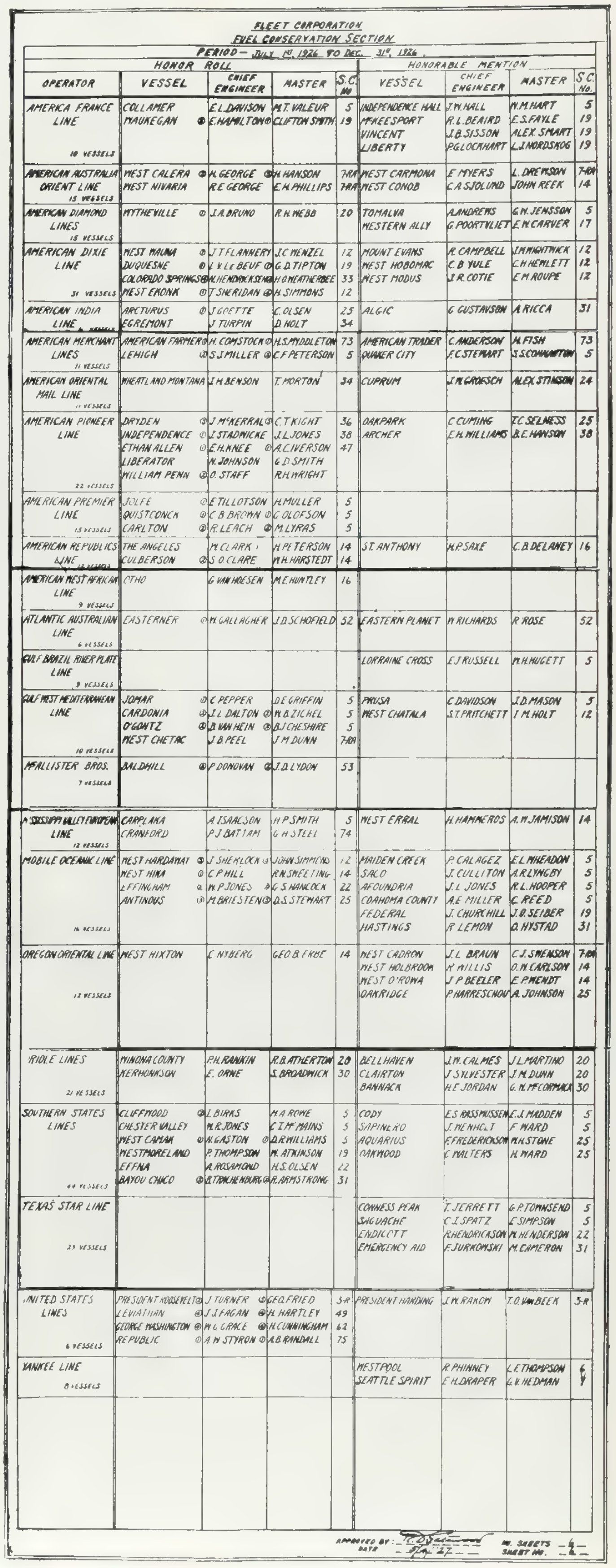
The honor roll is limited to the fifty best performing vessels and as there were so many vessels showing good performances that fell just a little short of making the Honor Roll, there has also been adopted an Honorable Mention Roll consisting of forty-seven vessels. This Honorable Mention Roll does not entitle the chief engineer and master to the fifty dollar bonus.

A high standard of efficiency has been set to entitle a vessel to be listed on the honor roll. It must have traveled at least 20,000 miles during the period covered and must have maintained a port and sea efficiency rating which is equal to 95 per cent of that of the best performer in the particular class or type of vessel in which the vessel falls. Particular attention is paid to maintenance of the vessel, embracing repair costs, physical condition and cleanliness throughout.

On the honor roll there are 16 vessels that make the grade for the first time; 15 vessels have been listed once before; 12 have secured mention twice; 4 three times; and 3 who have been selected four times. Of the chief engineers appearing on this honor roll, 26 show for the first time, 8 for the second time, 7 for the third time, 5 for the fourth time, and 4 for the fifth time.

In compiling this honor roll, a study has been made of the performance of 299 vessels for which complete records were available. During the period of the roll, these vessels have traveled a total distance of 6,812,051 miles. It is gratifying to note that the fuel performance of these vessels not only shows a continuance of the record that they have consistently established since the establishment of the Fuel Conservation Committee, but also show a total saving in oil consumption amounting to $233,250, and in coal consumption a saving of $50,343, or a total saving of $283,593, as compared to the previous six months period. Through the means of stimulating efficiency and interest throughout the operating forces on the vessels, the Fuel Conservation Committee is pleased to report that there has been an annual saving in the fuel consumption of approximately three million dollars per year, as compared with the fuel performance prior to 1922.

This remarkable saving could not have been accomplished without the earnest and conscientious efforts of the vessels' personnel and the port staff of the operating companies in adopting and utilizing to such a large extent the standard methods of operation promulgated from time to time by the Fuel Conservation Committee.



FLEET CORPORATION
FUEL CONSERVATION SECTION
PERIOD— JULY 1st, 1926 TO DEC. 31st, 1926.

HONOR ROLL					HONORABLE MENTION			
OPERATOR	VESSEL	CHIEF ENGINEER	MASTER	S.C. No	VESSEL	CHIEF ENGINEER	MASTER	S.C. No.
AMERICA FRANCE LINE 10 VESSELS	COLLAMER WAUKEGAN ④	E.L.DAVISON E.HAMILTON ②	M.T.VALEUR CLIFTON SMITH	5 19	INDEPENDENCE HALL McKEESPORT VINCENT LIBERTY	J.W.HALL R.L.BEAIRD J.B.SISSON P.G.LOCKHART	W.M.HART E.S.FAYLE ALEX. SMART L.J.NORDSKOG	5 19 19 19
AMERICAN AUSTRALIA ORIENT LINE 15 VESSELS	WEST CALERA ② WEST NIVARIA	H.GEORGE ③ R.E.GEORGE	H.HANSON E.H.PHILLIPS	7-RA 7-RA	WEST CARMONA WEST CONOB	E.MYERS C.A.SJOLUND	L.DREWSON JOHN REEK	7-RA 14
AMERICAN DIAMOND LINES 15 VESSELS	WYTHEVILLE ①	J.A.BRUNO	R.H.WEBB	20	TOMALVA WESTERN ALLY	A.ANDREWS G.POORTVLIET	G.W.JENSSON E.W.CARVER	5 17
AMERICAN DIXIE LINE 31 VESSELS	WEST MAUNA ① DUQUESNE ④ COLORADO SPRINGS ③ WEST EKONK ①	J.T.FLANNERY L.V.LeBEUF ① H.HENDRICKSEN ③ T.SHERIDAN ④	J.C.WENZEL G.D.TIPTON H.O.WEATHERBEE H.SIMMONS	12 19 33 12	MOUNT EVANS WEST HOBOMAC WEST MODUS	R.CAMPBELL C.B.YULE J.R.COTIE	J.M.WIGHTWICK C.H.HEWLETT E.M.ROUPE	12 12 12
AMERICAN INDIA LINE	ARCTURUS ① EGREMONT	J.GOETTE J.TURPIN	C.OLSEN D.HOLT	25 34	ALGIC	G.GUSTAVSON	A.RICCA	31
AMERICAN MERCHANT LINES 11 VESSELS	AMERICAN FARMER ③ LEHIGH ②	H.COMSTOCK ① S.J.MILLER ④	H.S.MYDDLETON C.F.PETERSON	73 5	AMERICAN TRADER QUAKER CITY	C.ANDERSON F.C.STEWART	H.FISH S.S.CONNAUGHTON	73 5
AMERICAN ORIENTAL MAIL LINE 11 VESSELS	WHEATLAND MONTANA	J.H.BENSON	T.MORTON	34	CUPRUM	J.M.GROESCH	ALEX. STINSON	24
AMERICAN PIONEER LINE 22 VESSELS	DRYDEN ③ INDEPENDENCE ① ETHAN ALLEN ① LIBERATOR WILLIAM PENN ③	J.McKERRAL ③ J.STADWICKE E.H.KNEE ① W.JOHNSON O.STAFF	C.T.KIGHT J.L.JONES A.C.IVERSON G.D.SMITH R.H.WRIGHT	36 38 47	OAKPARK ARCHER	C.CUMING E.H.WILLIAMS	T.C.SELNESS B.E.HANSON	25 38
AMERICAN PREMIER LINE 15 VESSELS	JOLFE ① QUISTCONCK ① CARLTON ②	E.TILLOTSON C.B.BROWN ① R.LEACH ②	H.MULLER G.OLOFSON M.LYRAS	5 5 5				
AMERICAN REPUBLICS LINE	THE ANGELES CULBERSON ②	W.CLARK S.O.CLARE	H.PETERSON W.H.HARSTEDT	14 14	ST. ANTHONY	H.P.SAXE	C.B.DELANEY	16
AMERICAN WEST AFRICAN LINE 9 VESSELS	OTHO	G.VAN HOESEN	M.E.HUNTLEY	16				
ATLANTIC AUSTRALIAN LINE 6 VESSELS	EASTERNER ①	W.GALLAGHER	J.D.SCHOFIELD	52	EASTERN PLANET	W.RICHARDS	R.ROSE	52
GULF BRAZIL RIVER PLATE LINE 9 VESSELS					LORRAINE CROSS	E.J.RUSSELL	W.H.HUGETT	5
GULF WEST MEDITERRANEAN LINE 10 VESSELS	JOMAR ① CARDONIA ④ O'GONTZ ④ WEST CHETAC	C.PEPPER J.L.DALTON ② B.VAN HEIN ③ J.B.PEEL	D.E.GRIFFIN W.B.ZICHEL B.J.CHESHIRE J.M.DUNN	5 5 5 7-RA	PRUSA WEST CHATALA	C.DAVIDSON S.T.PRITCHETT	J.D.MASON I.M.HOLT	5 12
McALLISTER BROS. 7 VESSELS	BALDHILL ④	P.DONOVAN ②	J.D.LYDON	53				
MISSISSIPPI VALLEY EUROPEAN LINE 12 VESSELS	CARPLAKA CRANFORD	A.ISAACSON P.J.BATTAM	H.P.SMITH G.H.STEEL	5 74	WEST ERRAL	H.HAMMEROS	A.W.JAMISON	14
MOBILE OCEANIC LINE 16 VESSELS	WEST HARDAWAY ⑤ WEST HIKA ① EFFINGHAM ② ANTINOUS ③	J.SHERLOCK ③ C.P.HILL W.P.JONES ④ M.BRIESTEN ③	JOHN SIMMONS R.N.SWEETING G.S.HANCOCK D.S.STEWART	12 14 22 25	MAIDEN CREEK SACO AFOUNDRIA COAHOMA COUNTY FEDERAL HASTINGS	P.CALAGEZ J.CULLITON J.L.JONES A.E.MILLER J.CHURCHILL R.LEMON	E.L.WHEADON A.R.LYNGBY R.L.HOOPER C.REED J.O.SEIBER O.HYSTAD	5 5 5 5 19 31
OREGON ORIENTAL LINE 12 VESSELS	WEST HIXTON	C.NYBERG	GEO.B.ERBE	14	WEST CADRON WEST HOLBROOK WEST O'ROWA OAKRIDGE	J.L.BRAUN K.WILLIS J.P.BEELER P.HARRESCHOU	C.J.SWENSON O.W.CARLSON E.P.WENDT A.JOHNSON	7-RA 14 14 25
ORIOLE LINES 21 VESSELS	WINONA COUNTY KERHONKSON	P.H.RANKIN E.ORNE	R.B.ATHERTON S.BROADWICK	20 30	BELLHAVEN CLAIRTON BANNACK	J.W.CALMES J.SYLVESTER H.E.JORDAN	J.L.MARTINO J.M.DUNN G.W.McCORMACK	20 20 30
SOUTHERN STATES LINES 44 VESSELS	CLIFFWOOD ② CHESTER VALLEY WEST CAMAK ① WESTMORELAND EFFNA BAYOU CHICO ③	I.BIRKS W.R.JONES W.GASTON ① P.THOMPSON A.ROSAMOND B.TRACHENBURG ③	M.A.ROWE C.T.McMAINS D.R.WILLIAMS W.ATKINSON H.S.OLSEN R.ARMSTRONG	5 5 5 19 22 31	CODY SAPINERO AQUARIUS OAKWOOD	E.S.RASSMUSSEN J.WENHOLT F.FREDERICKSON C.WALTERS	E.J.MADDEN F.WARD W.H.STONE H.WARD	5 5 25 25
TEXAS STAR LINE 23 VESSELS					CONNESS PEAK SAGUACHE ENDICOTT EMERGENCY AID	T.JERRETT C.J.SPATZ R.HENDRICKSON F.JURKOWSKI	G.P.TOWNSEND E.SIMPSON W.HENDERSON M.CAMERON	5 5 22 31
UNITED STATES LINES 6 VESSELS	PRESIDENT ROOSEVELT ③ LEVIATHAN ④ GEORGE WASHINGTON ③ REPUBLIC ①	J.TURNER ① J.J.FAGAN ④ W.C.GRACE ④ A.W.STYRON ①	GEO.FRIED H.HARTLEY H.CUNNINGHAM A.B.RANDALL	3-R 49 62 75	PRESIDENT HARDING	J.W.RAKOW	T.O.VanBEEK	3-R
YANKEE LINE 8 VESSELS					WESTPOOL SEATTLE SPIRIT	R.PHINNEY E.H.DRAPER	L.E.THOMPSON G.V.HEDMAN	6 4

APPROVED BY:
DATE 5/4/'27
NO. SHEETS 1
SHEET NO. 1

Auxiliaries-Ship Supplies-Marine Equipment

The Pacific Plug

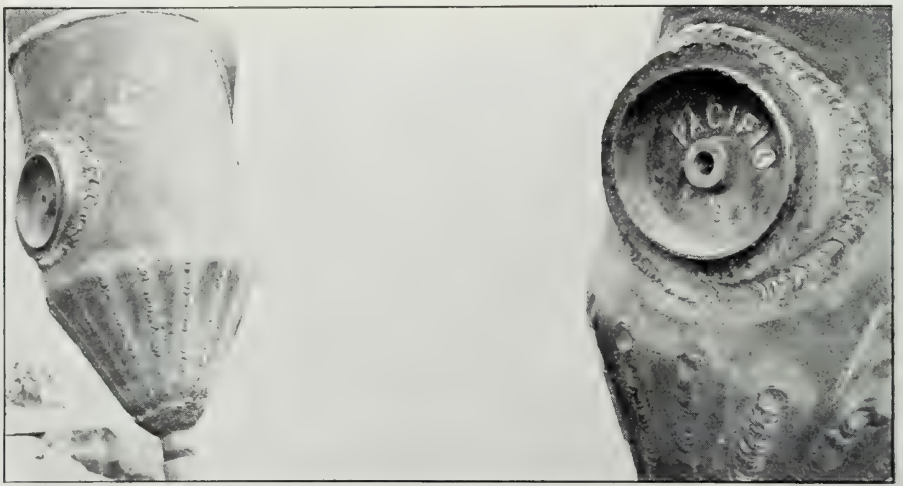


Fig. 2, an installation of a large Pacific plug mounted on an insert.

AT LAST there has appeared on the market a hand hole plug for boilers that satisfactorily meets all practical working conditions. This plug, known as the Pacific plug and manufactured on the Pacific Coast by the Pacific Copper and Brass Works, of Los Angeles, is a tapered elliptical plug and makes a metal seat in the plate. The plug, being elliptical, allows it to be inserted and removed through its own hole, a feature of recognized merit. The direct metal to metal seating of the plug is its outstanding feature and eliminates gaskets which have long been the source of trouble for the boiler operator. Furthermore, the direct metal to metal seating of the plug makes possible a one-piece plug construction taking the place of the usual five-piece plug and gasket ordinarily used. The metal to metal seat is made by a tapered fit between the plug and hole and without rolling or expanding the plug or the plate. The plug accurately fits the hole and seats tightly as pressure comes upon it.

In equipping a boiler, tank, or other like structure with Pacific plugs, the holes in the plates are dressed or rebored by a portable precision boring tool. This tool is a highly developed mechanism and operates to quickly rebore a hole so that it is truly elliptical and is tapered or inwardly divergent. The holes generated by this tool are uniform in size and shape and have well finished surfaces.

The tool has caused much comment because of the accuracy of its performance and its universal application to all types and forms of boilers. A ½-horsepower electric motor, operated from a lighting circuit, drives the tool, and the tool itself is little larger than the motor. The Pacific plug is a standardized factory-made product made from steel drop forgings. Special machines have been developed to produce these plugs so that they are uniform in size and shape, making them interchangeable in the holes made by the precision boring tool. The plugs have provision for studs so that they can be tightened in the holes, if necessary.

The accompanying illustration, Fig. 1, shows the Pacific plug in place in a 250-horsepower Heine type water-tube boiler. Another application of the Pacific plug is shown in Fig. 2. This figure shows an installation at the Los Angeles Gas & Electric Corporation at Los Angeles, where a Pacific plug is mounted on an insert. When the Pacific plug is used in connection with thin vessels or in plates in which the plug cannot be seated directly, an insert, as illustrated in Fig. 2, is used. The insert is welded in place and has a tapered elliptical seat to receive the plug.

Pacific plugs are made in standard sizes from 4x5-inch up to 9x 10-inch. Special large sizes to meet special conditions can be furnished, special installations being made from close grained electric steel castings.

Pacific plugs and closures can be utilized as inspection and clean-out plugs where desirable to install same in existing vessels such as air receivers, pipe lines, or dust collectors, and can be used to take the place of bolted-on covers and blind flanges. They are extensively used about gas-making plants and oil refineries.

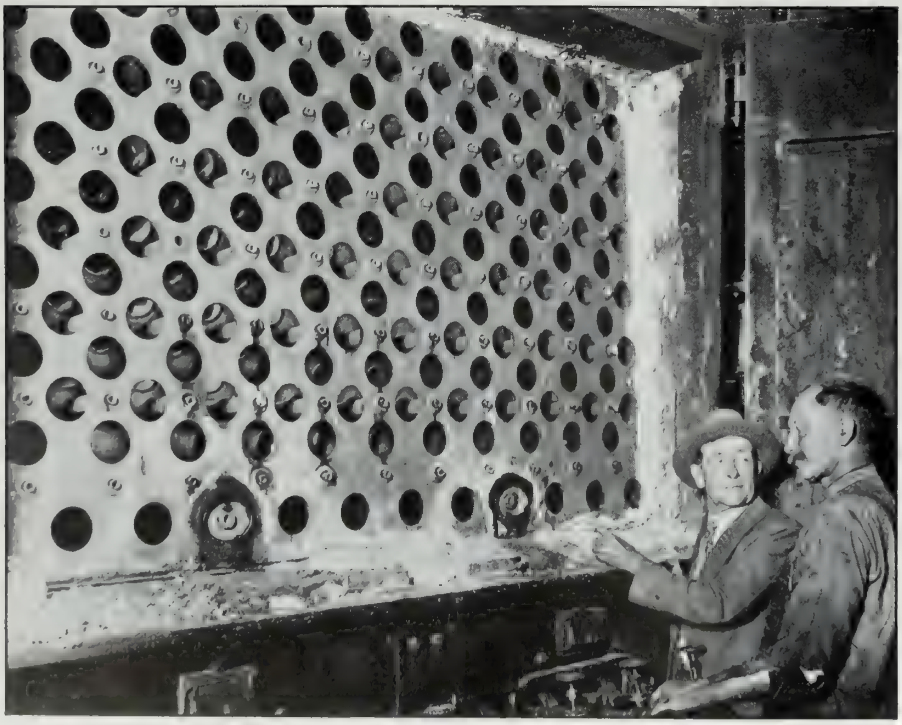
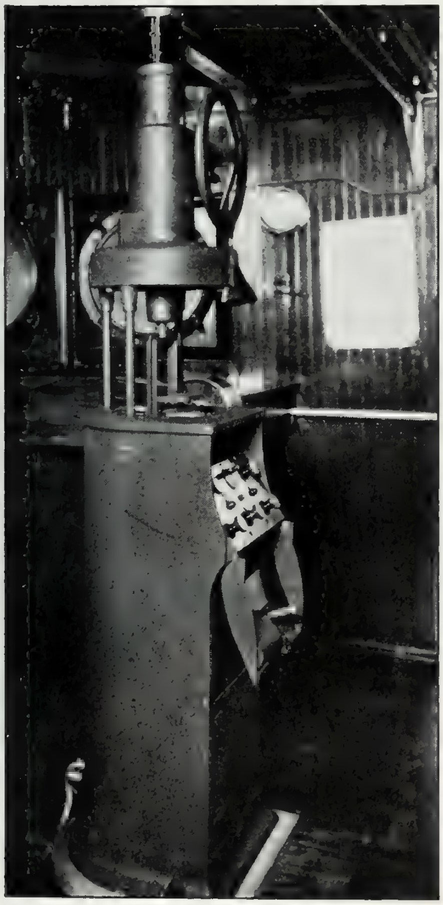


Fig. 1, Pacific plugs inserted in a Heine type water-tube boiler.

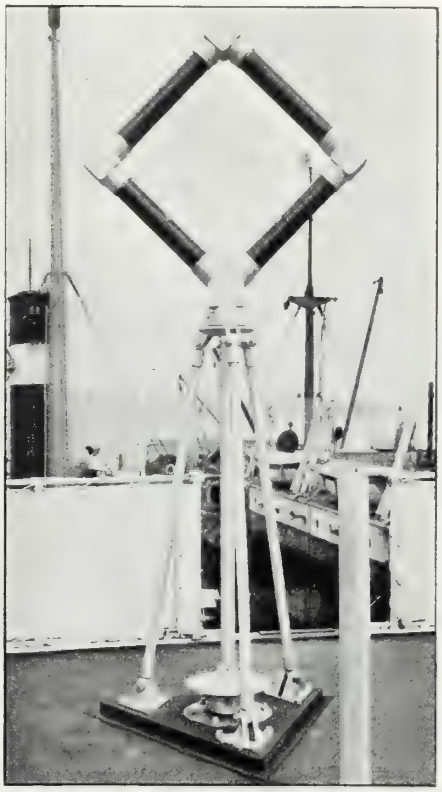
Efficient Aid to Navigation

SPEAKING before the Pacific Traffic Association at San Francisco, G. Harold Porter, manager of the Pacific Division of the Radio Corporation of America, recently presented an interesting review of radio communication, dealing particularly with its application to marine service and the advantages of their modern radio direction finding apparatus as an aid to navigation.

Going back some twenty-six years, Mr. Porter spoke of the crude apparatus employed in equipping the first American vessel, the steamship Philadelphia, with a communicating range of approximately 100 miles, and gave a graphic word picture of the remarkable progress in the art of radio, as evidenced by the modern tube transmitting and receiving apparatus for both telegraphy and telephony, as now installed upon the great ship Leviathan on the Atlantic, and the Malolo on the Pacific. Mr. Porter stated that there are no passenger carrying vessels on the Atlantic or Pacific more modernly equipped for radio communication service than the two vessels above named. With this change in the apparatus, the range of communication has been extended from the early commencement of 100 miles to the present practice of 2000 to 5000 miles in every-day service. Reference was also made to the recent experience of the steamship Carinthia, on a round the world cruise, when communication was established between a coastal station on the Atlantic with the Carinthia off the coast of New Zealand, an approximate distance of 10,000 miles. The San Francisco coastal station of the Radio Corporation also exchanged much traffic with this vessel all the way from San Francisco to Japan, likewise while en route from Manila to Auckland.



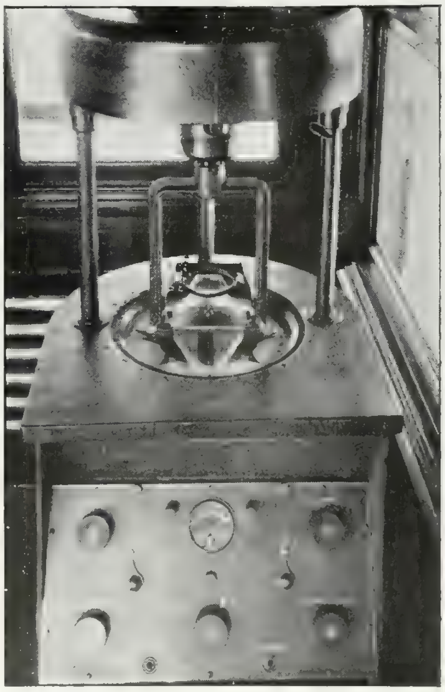
Pilot house of the steamer Yukon of the Alaska Steamship Company showing the radio compass in place.



R.C.A. Radio Compass loop on the Standard Oil tanker W. J. Hanna.

In addition to annihilating space and robbing the sea of its isolation, there are many humanitarian services rendered navigation today through the medium of this art. The present model of radio compass, which is extremely selective, directs the mariner through fog and uncertain positions; storm signals are broadcast daily to all ships; in case of illness or accident on board a vessel not carrying a physician, medical aid can be obtained from shore or sister ships, without cost. Radio has, indeed, contributed tremendously in the protection and saving of life at sea.

The tremendous importance of this service is not always appreciated until some tragedy or incident of unusual character occurs. In fact, it was very difficult in the early days of wireless to sell the service to the shipping industry and it was not until wireless played its dramatic role in the saving of many lives from the collision of the steamships Florida and Republic on January 23, 1909, and the still greater disaster that befell the Titanic on her maiden voyage, when she collided with an iceberg on April 15, 1912, that the real value of this service was reasonably appreciated. It will be recalled in the case of the Titanic disaster, that more than 700 of her passengers were saved in consequence of prompt response to her distress calls sent out by radio. While it is true there was a terrific loss of human life in that catastrophe, it is equally true that the list would have been augmented by 700 more, had it not been for the relief brought by the S O S of radio.



Close-up of the control board and the compass reading device of the radio compass on the steamship Illinois of The Texas Company.

Engine Indicators

IN DETERMINING the developed horsepower of any reciprocating pressure engine, it is necessary to know the average pressure working on the piston. Since the days of James Watt, who invented the first instrument for this purpose, mean effective pressure, as this average pressure is called, has been determined by the use of the engine indicator diagram. This instrument has been gradually perfected, keeping pace with the increases in pressure and in the piston speed used in the reciprocating engines. The higher speeds and greater pressures of internal combustion engines brought new problems to the designers of the indicator, and these have been successfully solved by careful attention to detail and design so as to eliminate errors due to vibration and momentum of reciprocating parts.

The Bacharach Industrial Instrument Company of Pittsburgh, represented in California by C. V. Lane of San Francisco, have developed a very interesting and efficient line of engine indicators under the trade name Maihak.

In the ordinary use of the engine indicator, it is necessary to determine the area of the indicator cards by the use of the planimeter in order to arrive at mean effective pressure. This involves considerable time, particularly with the multiple cylinder internal combustion engines where hundreds of indicator cards may be produced in a few minutes. In order to make possible intensive tests of such engines, the Bacharach Industrial Instrument Company has, after much experiment, produced a combination Maihak engine indicator and power integrator, by which the principle of the planimeter measurement is built into the instrument in such a way that the mean indicated horsepower of the cylinder under observation is registered directly on the dials of the instrument. The ordinary mechanism for the taking of indicator cards is mounted on the same block, with the pencil mechanism detachable. When cards are to be taken, the counter mechanism is disconnected by turning it a few degrees on its axis and the pencil mechanism is mounted to make the diagram on the card. When the counter alone is to be used for a long series of power readings, the pencil mechanism is disconnected from the piston rod.

The Bacharach Industrial Instrument Co. manufacture a full line of fittings and equipment especially adapted for the application of the Maihak indicators to various types of engine cylinders and piston rods. Of principal interest to the users of internal combustion engines is the Maihak Indicator No. 4, which will give accurate and trustworthy results up to speeds of 2200 revolutions and pressures of 1400 pounds per square inch.

The essential feature of the difference between this indicator and the ordinary type lies in the cantilever spring, which requires much less mass for the same pressures than does the helical type, and which makes possible a reduction of the length of the piston shaft of the indicator to about one-fourth that of the similar part for the standard type indicator. The cock of this indicator is especially designed to balance the initial shock on the piston at the moment of opening.

Pioneer Separator

IN THESE days of keen competition, it is necessary for the operator of the steam plant afloat or ashore to use every precaution for insuring the transmission of clean, dry steam from his steam generator to his prime mover. Four methods are in vogue for cleaning steam or air, gas, ammonia or other vapors of the objectionable liquids and solids that may be carried over in their distillation. These methods are baffling, centrifugal force, sudden alternate changes in the direction of travel, and sudden changes in velocity. The effect of any or all of these separating principles is greatly enhanced by dividing the vapor into thin streams in order to secure the positive individual treatment of all portions.

In the Pioneer Separator, the vapor is divided into many different streams and all four of the separating methods described are employed thousands of times during the passage of the vapor through the separator. In a 10-inch Pioneer separator, for instance, steam, on entering, is first divided into 56 different vertical streams. These streams are kept entirely separated by continuous, angular shaped baffle walls, between which each stream is individually purified before rejoining the others at the outlet. In the aggregate of the 56 streams, the steam is baffled, whirled, and sharply changed in velocity, changed in direction of its travel, and in the direction of its stream 8400 times. The liquid separated from these streams is caught, held, and positively drained down at 1680 different points. For each inch of its travel, the steam is subjected to complete treatment 10 times, and the process is repeated over and over again hundreds of times in each separate stream. Incident to this continuously repeated treatment, no appreciable back pressure is set up, the total area of the narrowest path through the separator being several times greater than the area of the connecting pipe.

The Pioneer separator is structually strong, very compact, and has no parts which can become loose in service. It can be furnished for any working pressure in a variety of stock patterns and, when required, special shapes with outlets at any angle can be built to order. It may be installed in place of an elbow in a steam line. It can be furnished in combination with a feed water heater or with a high or low pressure receiver.

The delivery of entirely dry and entirely cleaned steam is guaranteed where the Pioneer separator is installed under proper conditions. As an example of its work it may be stated that the Pioneer Separator is being used in silk dyeing baths, where even a trace of oil would be prohibitive. The condensate from this installation has no taste or smell and does not show the slightest opalescence. The Pioneer separator has been used with great efficiency in the removal of dust from air in blower and fan operations and may be used with either dry or irrigated wicks for cleaning any gas.

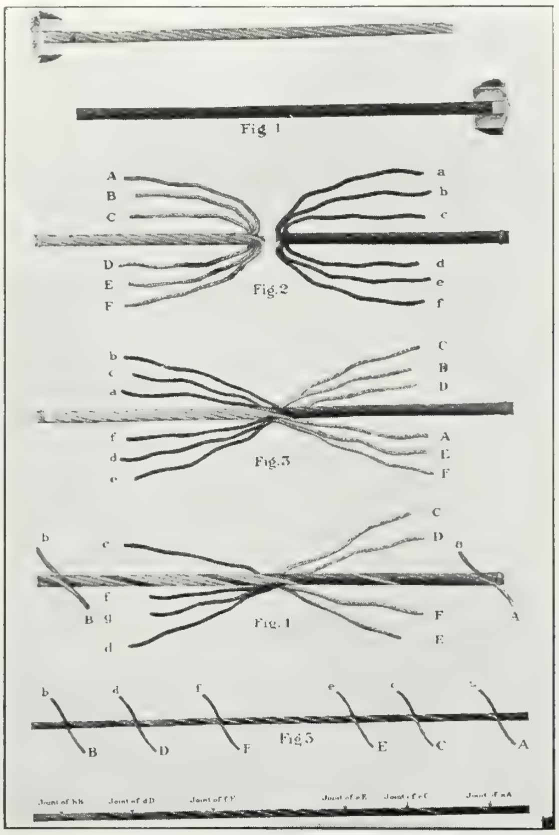
This separator is manufactured by the Pioneer Equipment Corporation of America, who are represented in northern California by H. Plummer of Alameda.

How to Splice Wire Rope

IN splicing wire rope, in order to prevent appreciable loss of strength at the splice, it is customary to make the splice not less in length than that given in the table below for ropes of different sizes:

Length of Rope	Length of Splice
1/2 inch	15 feet
5/8 inch	20 feet
3/4 inch	24 feet
7/8 inch	28 feet
1 inch	32 feet
1-1/8 inch	36 feet
1-1/4 inch	40 feet
1-1/2 inch	45 feet

In splicing the two ropes, fasten the ends so that they overlap, allowing for a splice of from 15 to 45 feet, as indicated by the above table. For purposes of explanation we will assume a 30-foot splice. First wrap or tie the ropes securely with iron wire 30 feet from each end, then unlay all strands 15 feet as shown in Fig. 2 of the accompanying plate, cutting away the hemp core to permit bringing the two unstranded ends together so that the strands will interlock as in Fig. 3.



Take strand (a) and unlay it until the wire binding is reached, then in the open groove place strand A. Lay A in tightly as shown in Fig. 4, making twist agree exactly with twist of the open groove. Proceed in this way until all except two feet of A are laid in, then cut off (a) and A, leaving the ends about two feet long. Now unlay strand B in the opposite direction and in its place put strand (b), stopping the ends of the rope in the corresponding position to A, Fig. 4.

Subsequently (c) will be replaced by C, but this should be stopped six feet short of the junction of A and (a), as shown in Fig. 5. Similarly, D should be replaced by (d) and the end stopped six feet short of Bb.

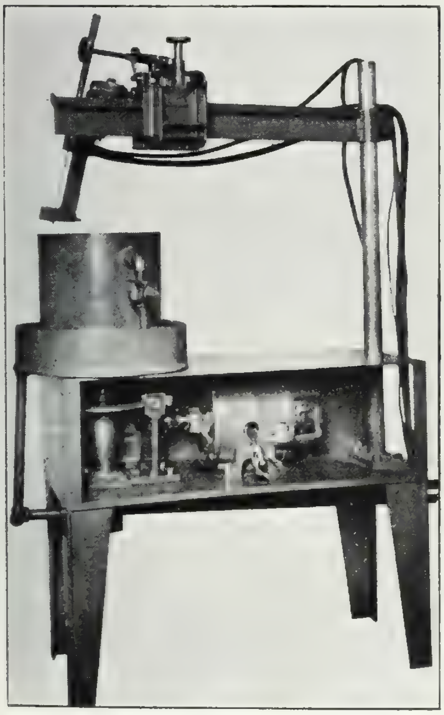
Proceed similarly with Ee and Ff, stopping the ends six feet short of Cc and Dd respectively.

The rope will now present the appearance shown in Fig. 5 and the only remaining step is to tuck in the ends in such a way that the diameter of the rope will not be enlarged where the ends are tucked in. This is done by removing the hemp center and putting the ends of the strands in the place previously occupied by the core. To do this, it is first necessary to open or untwist strands Aa so that the hemp center can be seized with a pair of pliers and pulled out. Then a marline spike is inserted to keep the gap open. After starting the loose ends into the space left vacant by the removed core, rotate the marline spike so as to force the strand into place.

Upon completion hammer the rope lightly with a wooden or copper mallet, in order to assure a uniform diameter throughout the length of the splice.

Photo and information through courtesy of American Cable Co.

Makes Welds Under Water

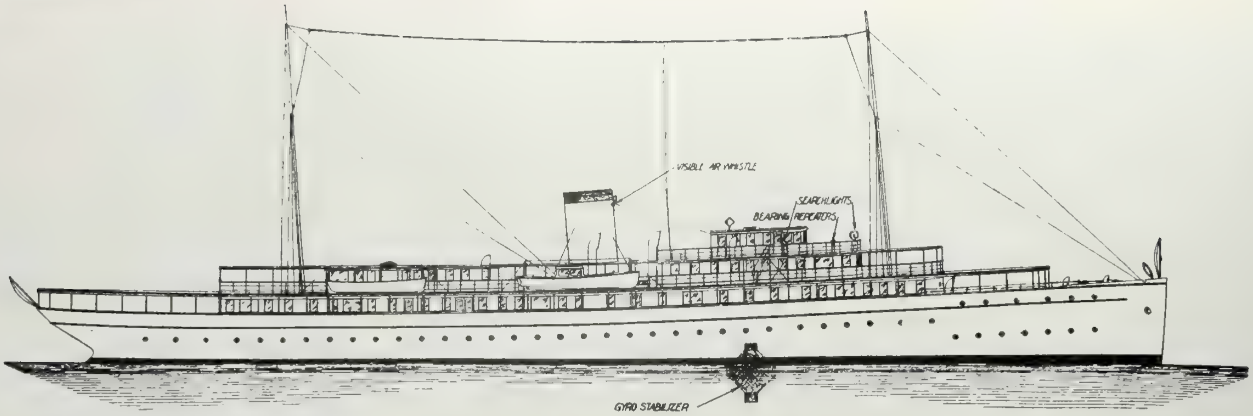

New carbon arc-welding machine built by the Lincoln Electric Co.

RAPID extension of the field of usefulness of electric arc welding has induced manufacturers of this type of equipment to bring out many new and interesting welding machines. The accompanying illustration showing a new carbon arc welding machine built by The Lincoln Electric Company, Cleveland, Ohio, is an example of one of the latest machines of this type.

The automatic carbon arc welding machines have been found adaptable to welding of pieces in which no preparation of the edges to be welded is made. The machine shown will weld circular seams up to twelve inches in diameter. A particular feature of the machine is the cooling tubs around the revolving table which carries the piece being welded. The piece on which the welding is being done may be partially or totally immersed in water during the welding operation. Cooling water is in circulation in the tubs during operation.

The novel cooling arrangement used on this equipment was developed to meet the requirements when welding high grade alloy steels on which the heat disturbance due to application of welding heat must be reduced to a minimum. In the case of 12 per cent manganese steel the welding may be done with the piece totally immersed in water and the arc submerged. This cooling arrangement is well adapted to the welding of manganese steel since the rapid quenching of the molten metal gives it the physical properties expected in 12 per cent manganese steel.

The frame and details of the machine are all made of welded steel construction and the machine itseif is an excellent example of the rapidly growing tendency to use welded steel construction.



Sperry Equips Largest Motor Yacht

THE reduction in crew and freedom from annoyance of coaling ship which a modern diesel yacht affords have made this type of craft increasingly popular and caused an unprecedented number of beautiful yachts of this type to be constructed during the last few years. Keen interest has thus been aroused in the announcement that the well-known firm of New York naval architects, Henry J. Gielow, Inc., have contracted with Pusey & Jones, Wilmington, Delaware, for the largest motor yacht yet undertaken. This beautiful vessel shown in the accompanying cut, will be 294 feet overall, with a beam 38 feet 3 inches and draft of 16 feet. Two 1500 H.P. Bessemer engines will drive her at a cruising speed of 16 knots and the oil capacity will provide for a cruising radius of 10,000 miles.

With a size such as this, commodious appointments are possible, for instance an owner's observation room 18 feet by 18 feet forward and a lounging room 17 feet by 19 feet aft, the dining room on the main deck 24 feet by 26 feet and the living room 24 feet by 26 feet. The owner's quarters consist of stateroom, two bath rooms, two dressing rooms and maid's room. At the after end of the deck house is a conservatory 16 feet by 24 feet. Guests' state rooms on the deck below the owner's quarters consist of seven double staterooms, each with its own private wardrobe and bathroom. Electricity will be used for heating. Cool or hot air according to the outside temperature will be forced through vents where the proper degree of humidity will be obtained by bleeding steam into the vents.

This beautiful yacht will have the advantage of all the Sperry Gyroscope Company's aids to navigation. These include: complete Sperry Gyro Compass equipment; Gyro Stabilizer; a Sperry Gyro-Pilot installation of the two unit type; Sperry search lights; Sperry helm angle indicator; Sperry engine speed indicator; and Sperry visible air whistle. The locations of these items are shown in the illustration. Such importance is placed upon the equipment that the Gyro- Compass, for instance, will have a special room on the boat deck with a stairway to the owner's quarters below. But perhaps the most important and interesting item of Sperry equipment is the gyro ship stabilizer. This will be mounted in the forward part of the engine room. A special observation platform will be provided where the owner and his guests may sit and view the working of the stabilizer and other engine room equipment. It is interesting that the rotating gyroscope of the stabilizer, drawn to scale in the cut, need only be 8 feet in diameter and weigh 20 tons to completely stabilize this 294-foot vessel displacing 2300 tons.

Gyro-Compasses and Pilots for Many New Yachts

Due to the unique contribution of the Gyro-Compass and Automatic Steering to yachts where accurate navigation is required in restricted waters, the Sperry Company has had the pleasure of equipping the majority of the beautiful new vessels of this type built during the year. Typical installations made are the following:

Amo II, Hon. H. A. Guiness, 79 feet long; Aras, Hugh J. Chisholm, 162 feet long; Athero, Jesse Livermore, 171 feet long; Oaxaca, Allan Hancock, 254 feet long; Robador, Robert Law, Jr., 160 feet long; Saverona, Richard Cadwalader, Jr., 185 feet long; Sialia, Henry Ford, 223 feet long; Spray III, Henry P. Joy, 77 feet long; Sumar, David C. Whitney, 160 feet long.

In addition to the 295-foot yacht described, equipments are now being installed on Mr. Roebling's 80-foot yacht, Mr. Sorensen's 105-foot yacht, and it is expected that several other well-known yachts will soon join the ranks of those enjoying the added safety and efficiency of true north navigation.

New Float Switch

THE General Electric Company announces a new float switch bearing the designation CR-2931-P for use in control circuits only. This switch, in general, will be used to control the line contactor of alternating or direct current automatic starters. It has a capacity for handling one 600-ampere, two 300-ampere or four 150-ampere A.C. or D.C. contactors at from 110 to 550 volts.

A very simple design is employed. No castings are used. A double contact eliminates shunts, and oxidation trouble has been eliminated by the use of silver contacts. The movable contacts are held by a molded bakelite arm which obtains its snap action in opening and closing the switch through a special mechanism.

The switch may be attached directly to a support extending across the tank or by means of a side bracket supplied with it. This bracket is reversible, and provides for various methods of fastening. The case, which is splash-proof, has provision for a half-inch conduit at the top.

SAN FRANCISCO PUBLIC LIBRARY

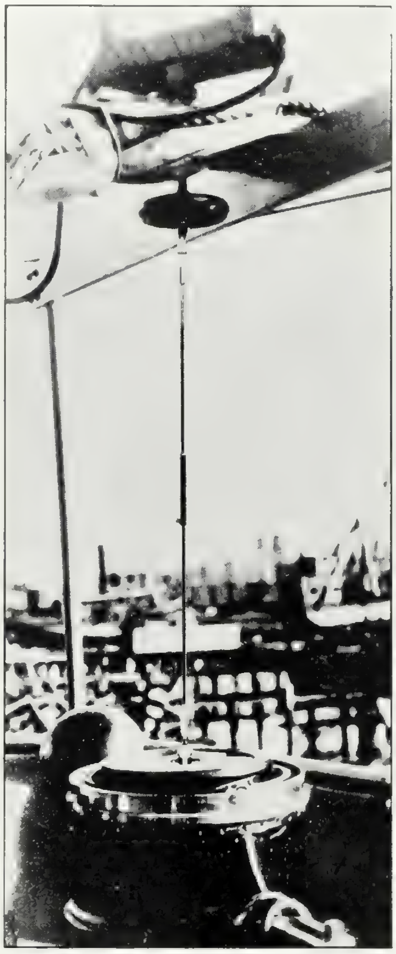
A Radio Compass Reading Device for Ships

THE advantages of radio direction finding on shore beacons by means of apparatus aboard ship are quite generally known and appreciated, but perhaps a wider application of this manner of location at sea is not practiced because of the present expense and space requirements of the necessary installation. However, what is claimed to be a simplification of some of its mechanical features, as devised and patented by Lt. E. R. Hand of the Coast and Geodetic Survey, may possibly be the means of further popularizing the shipboard method of radio fixes.

Utilizing the ship's standard compass, and the usual type of loop installed above the awning frames and in a vertical line with the binnacle, this new addition to the art affords means of a temporary mechanical connection between the two. The vertical shaft of the loop terminates on the underside of the awning frames, and a small handwheel is placed thereon within easy reach.

When radio bearings are desired the connecting device is assembled and suspended from the protruding end of the loop shaft, and so adjusted that a reading bar just reaches the glass face of the compass. The instrument then rests upon the compass, but so lightly as not to interfere in the slightest with its free movement in the gimbals. As the loop is turned by the handwheel overhead the slender connecting shafting causes the reading bar (pivoted over the mathematical center of compass card by means of button-like boss cemented to the glass) to rotate in equal measure upon the compass glass, with negligible friction; and by looking down through the specially designed parallax-reducing slits in the ends of the bar, the varying angle made by the loop may be read directly upon the compass card. A unique adaptation of the universal joint principle permits this bar to cling closely to the horizontal glass regardless of rolling of vessel.

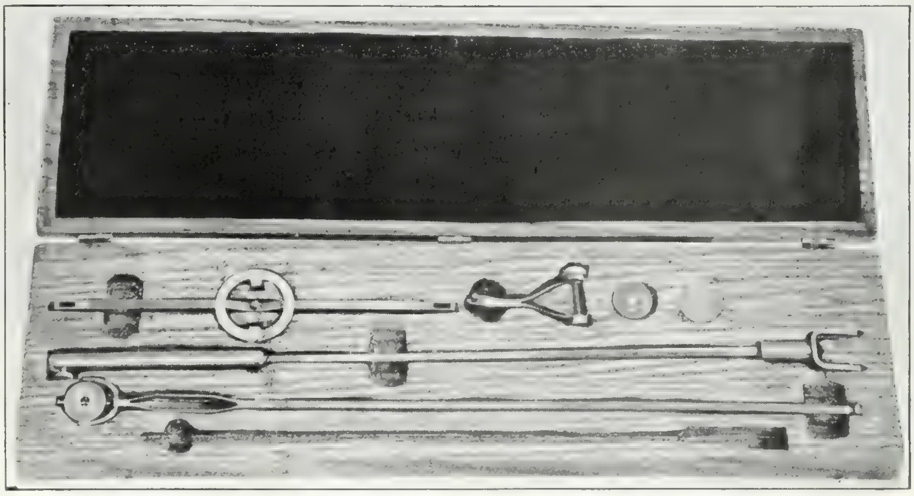
There is said to be practically no horizontal play in the contrivance, but sufficient vertical play is provided for, to take up normal vibration of the vessel, and in case of severe vertical shock to cause the shafting to telescope rather than punch a hole into the compass bowl. It is claimed the instrument will not interfere with visual bearings taken by azimuth circle which may be in place at same time; for a twist of a thumbscrew permits shafting to be so turned that line of sight goes through bowed portion designed for that purpose. With radio bearings completed the apparatus may be quickly disassembled, and packed in a flat box not much larger than a drawing instrument case.



The Hand radio compass reading device.

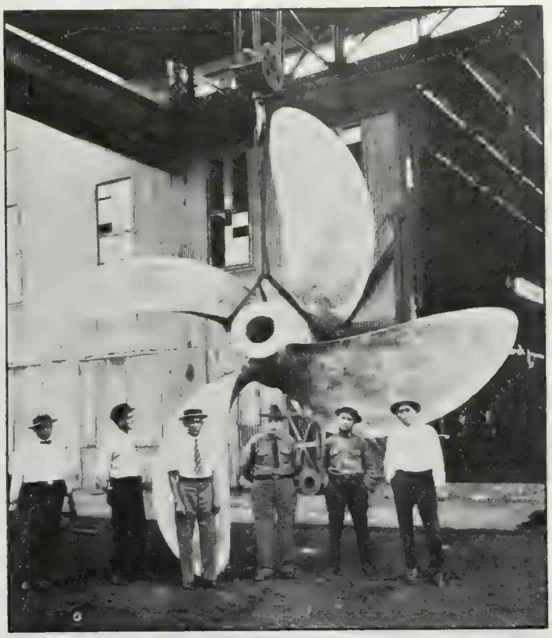
Nothing electrically new is offered in this invention; observing on radio transmitting stations the usual maximum and minimum method is employed, utilizing the characteristic curve of a loop antenna. A receiving set, adapted to the peculiar needs of loop reception and to the frequency of the transmitting beacons, might be placed experimentally in the wheelhouse; the leads to it from the loop might, for economy of installation, lie loosely on the bridge canvas in lieu of the probably more satisfactory slip-ring contacts; the ship's operator, wearing the phones and manipulating the dials, might sing out through speaking tube to the watch officer at handwheel to "left loop," "right loop," and "mark" and the swings would be read by him directly on the compass card; the means would then be corrected for the calibration error, deviation and variation, in the accepted manner. This two man method might be justified on the idea of a navigator making a poor radio operator and the latter possibly a worse navigator.

It is not advanced that the above-described variant from present radio position practice could supplant the Kolster (or similar) instrument, but it might possibly fill a need with the shipmaster who, either because of scant funds or infrequent use of radio beacons, does not desire that separate and comparatively elaborate and expensive installation.



The radio compass reading device packed in its case.

Honolulu's Largest Propeller



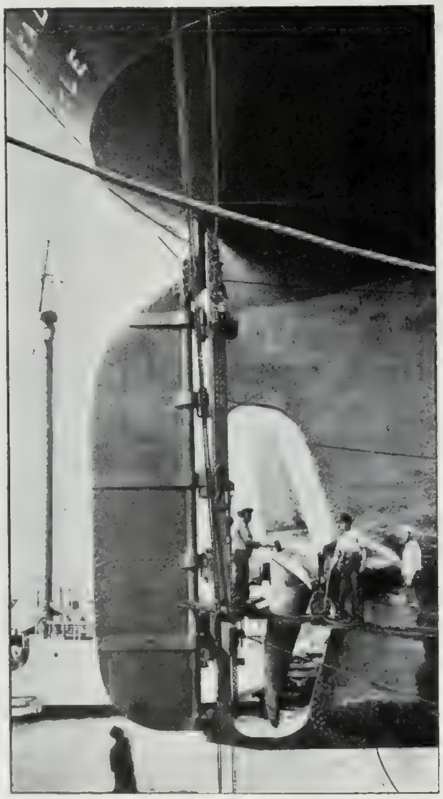
Bronze 4-bladed propeller cast by the Honolulu Iron Works for the steamship Sheaf Mead, 17 feet 6 inches diameter, finished weight over 10½ tons.

THE Honolulu Iron Works is justly proud of the recently completed installation of a new propeller on the British steamer Sheaf Mead under rather unusual circumstances.

En route from Kobe to Victoria, this steamer, a 7600-ton freighter of the Sheaf Steamship Company, when five days out in ballast met the tail end of a cyclone and two of her propeller blades were carried away. Fortunately these blades were on opposite sides of the screw, and the vessel was able to proceed under her own power. Captain H. B. Rae declined aid from other vessels that were within wireless call and headed for Honolulu, where he arrived twenty days later. In the meantime the accident had been reported, and the Honolulu Iron Works had quoted a price on a new propeller through W. A. Souter & Company of Newcastle, England. In reply they received the following cable:

"Sheaf Mead accept quotation for bronze propeller, four bladed, right hand seventeen feet six inches diameter, seventeen feet three inches constant pitch, hundred square feet of surface. (Stop.) Finished length of boss two feet nine and one-quarter inches. (Stop.) Finished diameter of large end of cone fourteen and five-eighths inches. (Stop.) Finished diameter of small end of cone thirteen and one-eighth inches. (Stop.) Cone to be left half inch small until ship arrives. (Stop.) Tips of blades to be thrown aft twenty-seven inches from center line of boss. Cable if further particulars required. Steamer due the first of March. Rely on you pushing forward propeller castings and minimize delay of steamer."

On this information and without having had any opportunity to measure the ship or propellers themselves, the engineering organization made tracings and the pattern shop made the necessary patterns. On February 28 the molding operations were started and at noon twelve days later the casting was poured. On March 16 the casting had been cleaned and taken to the machine shop, where it was bored, faced, and polished. The finished weight of this casting was 20,650 pounds. On March 18, at 5:30 p.m., it was taken to the ship, where the marine gang of the Honolulu Iron Works installed it, finishing the work the next day and seeing the ship off the floating dry-dock and in the water again by noon of March 19. The vessel sailed the same day.



The stern of the Sheaf Mead on dry-dock at the Honolulu Iron Works, showing old propeller with broken blade being removed.

This propeller is the largest screw ever made in Hawaii, and probably the largest bronze casting ever poured in the Islands. The designs, patterns, molding operations, molding and pouring were all performed by the Honolulu Iron Works organization.

Refractory Maintenance

IF refractory construction could be maintained in a condition approximating its newly-built state, it is readily apparent that lining life would be materially prolonged, and that refractory repair costs would be greatly reduced.

Botfield Refractories Company, Philadelphia, has developed a method of maintenance that makes it easy to keep refractory construction in good condition through periodic and systematic maintenance.

By this new method, linings can be returned to good condition whenever the equipment is out of service for a short time. Sometimes, the repairs can be made without interrupting the operation of the equipment. Cracks, crevices, joints and brick pores can be filled up, quickly and efficiently.

In this method of refractory maintenance, three major elements are employed. They are The Adamant Gun, Adachrome (a chemically-neutral refractory material), and Adamant Fire Brick Cement.

The Adamant Gun is used for blowing protective coatings on brickwork in the form of pre-mixtures of Adachrome (or other refractory materials) employing Adamant Cement as a binder.

Weighing less than four pounds, this gun requires only one man for operation. It uses air or steam at 50 lbs. pressure or more. As air is more satisfactory in results, its use is recommended wherever possible. The operator simply connects the air line to the ½-inch standard pipe thread opening on the Globe Valve of the gun, places the supply pipe in the pre-mixture, turns the Globe Valve, and the Adamant Gun sprays the pre-mixture, smoothly and evenly on the structure. Thus, all brick pores, open joints, cracks and crevices are quickly filled and the wall is given a protective coating that is highly refractory and resistant.

Trade Literature

The Oxwelder's Manual has recently been issued by the Oxweld Acetylene Company of New York, Chicago, and San Francisco. Price $1.00.

This is a text book as well as an instruction manual for welding and cutting by the oxy-acetylene process. It is the 9th edition of the publication and has been completely rewritten, embodying all the latest developments in this modern and highly efficient aid to the metal industries. The book contains twenty-five chapters, each one devoted to a separate operation in which welding may play an important part. It is a book which should be in the hands of every worker who wishes to become informed in the best practices for the welding and cutting of metals.

The Bethlehem Steel Company has issued Catalog K on the subject of **Mine and Industrial Track Equipment, and Other Products.**

The subject of mine and industrial track equipment is of general interest to the majority of our readers, and especially to those interested in wharf and terminal warehouse equipment. Under the heading of "Other Products" are listed several products of the Bethlehem plant which are of especial interest to shipbuilders, naval architects, and marine engineers, namely, galvanized and blue enamel sheets, wire rods and wire nails, small tools, and Bethlehem genuine old-fashioned charcoal iron boiler tubes.

Foote Bros. Gear & Machine Co., of Chicago, has recently brought out their Catalog No. 201, **Gear Problems and IXL Speed Reducers**. This is a handy-sized catalog of 650 pages, and is the result of "two years of preparatory work and a good deal of money expended to tabulate, compile and present the information in simple, comprehensive, usable and understandable form. The book contains engineering information on speed reducers, conveying equipment, gears of all kinds, mathematical tables, and a wealth of technical data on mechanical engineering topics. It is carefully indexed, contains complete information as to sizes and kinds of the products of this company, and a list of district representatives.

"Gear Problems" should be in the hands of every engineering department, chief engineer, designing, production, or maintenance engineer, purchasing agent, or anyone who wishes to keep abreast of the latest developments and products of this large gear manufacturer.

Arc Welding, The New Age in Iron and Steel, is a new text book just issued by The Lincoln Electric Company, of Cleveland. It is of handy size, bound in imitation leather. Price $1.50.

This book is a most comprehensive text book on the use of arc welding in general manufacturing processes. It brings out the fact that no longer can arc welding be looked upon as merely a repairing or salvaging process—the chief field for its use being to take the place of riveting in new work, paticularly in the manufacture of tanks. Separate chapters are devoted to the various uses for this latest method of joining steel members. The book is profusely illustrated, and at the end contains a small catalog section of the various arc welding units manufactured by the Lincoln Electric Company. These books are carried by branch offices and agencies in the leading cities of the United States.

The South End Warehouse Co., of San Francisco, has issued an interesting booklet of pocket size, which is given the title of **A San Francisco Branch with a Flexible Overhead.**

The booklet is addressed particularly to the eastern manufacturers who are desirous of more firmly entrenching themselves in the Pacific Coast trade, and points out "what the Pacific Coast markets have to offer the eastern manufacturers." The South End Warehouse Company operates five free warehouses, two custom bonded warehouses, and the Internal Revenue General Bonded Warehouse No. 2. These booklets will be gladly sent to anyone addressing this magazine.

We have received from various ports annual reports of their activities. Among the most impressive and beautifully edited of these port books is the **Port Handbook of New Orleans.** Several editions have been made of this interesting booklet, including a paper bound desk edition and a leather covered pocket edition.

The Port of New Orleans is governed by a Board of Commissioners, chosen by the governor of Louisiana from the shipping men of New Orleans. This Board consists of five men, one of whom is appointed each year to serve five years. The Board selects a manager for the port and supervises the policy of administration and expansion. The booklet contains much interesting data concerning the port of New Orleans, and is beautifully illustrated with full page half-tone engravings and colored maps of the harbor and of the Mississippi River.

The Port of Charleston, South Carolina, has issued its yearly handbook. This booklet is always teresting to us, as it contains, in addition to the annual port statistics and a very complete resume of the port's facilities and activities, some very interesting illustrations of historical and modern scenes at this interesting old city, once the chief port of North America.

Storage Batteries Afloat

The use of storage batteries on vessels of all classes has become universal. The smaller craft employ them for auxiliary lighting and also for starters of main engines in some cases. The larger steamers and motorships use banks of batteries for handling wireless apparatus. One of the latest installations for this purpose was on the whaler Lansing, where a set of fifty-six Willard cells was installed as auxiliary power for her wireless set. The United States Transport Somme has also had sixty of the same type of Willard cells recently installed. Julius Brunton Sons are marine sales agents in San Francisco for the Willard battery.

The Japanese government purchases many products manufactured in California. To mention one, a steamer recently leaving for Japan from San Francisco took as a shipment fifteen hundred pounds of the E. A. Key Co's. graphite paste, manufactured in Los Angeles and sold through the C. E. Rhodes Company of San Francisco. Large quantities of this paste are used locally in the making up of joints of pipes and in gasket doping. Many users prefer it to any other mixture.

Trade Personals and Organization Notes

NEW HEAD OF FAIRBANKS-MORSE

AT THE annual meeting of the Directors of Fairbanks, Morse & Company, on March 29, W. S. Hovey was elected president, the former president, C. H. Morse, becoming chairman of the board. This is the first time this position has been held by a man not of the original Morse family.

Born in 1875, a graduate of Cornell, Mr. Hovey joined the Sheffield Car Co., an affiliation of Fairbanks-Morse, in 1902, as assistant superintendent. Later he became superintendent, which position he held until 1913, when he was transferred to the Beloit Works of Fairbanks-Morse as manager of the Engine Division. A few months later saw him general manager of that plant. In 1919, Hovey was elected vice-president in charge of all the manufacturing activities of Fairbanks-Morse and in 1924 he was made general manager of the entire business.

Mr. Hovey's elevation to the presidency brings a man to the helm of this company who has worked his way up through the ranks. His thorough grasp of all factors of this widely extended business makes him, in the opinion of his associates, well suited for the new office. He will remain general manager.

W. S. Hovey, new president of Fairbanks, Morse & Co.

EARL F. TOWNSEND

EARL F. TOWNSEND, who has been identified with Pacific Coast steamship operations for twenty years, has recently become a member of the firm of Townsend, Jackson & Co., Inc., with offices in Tacoma and Seattle. This firm handles investments, specializing in bonds.

Earl F. Townsend

Earl Townsend began his steamship experience with the Pacific Steamship Company in 1908 in Seattle. With the exception of a short time spent in the Army during the late war, he has been identified with Pacific Steamship Company, the Admiral Line, and the Admiral Oriental Line and Dollar Steamship Line for all of the twenty years. In 1920 he became assistant foreign manager of the Admiral Oriental Line, opening the Singapore office for that line in May of that year. After fifteen months in Singapore, he was appointed general agent in Kobe and Hong Kong. In 1923, he was appointed Oriental manager with headquarters in Shanghai. When the Oriental organizations of the Admiral Oriental Line and the Dollar Steamship Line were merged, Townsend carried on as Oriental manager for the new organization, carrying on the work of directing traffic, both passenger and cargo, for the Oriental services.

LINCOLN APPOINTMENT

The Lincoln Electric Company of Cleveland announces the appointment of Royal D. Malm as western district sales manager, with headquarters at Chicago.

Mr. Malm is an engineering graduate from Case School of Applied Science, Cleveland, class of 1912. For four years after graduation he was engaged in construction engineering and then became identified with the Elyria Iron & Steel Company. Later he went with the Standard Welding Division of the Standard Parts Corporation as general superintendent. For the past year Mr. Malm has had charge of Lincoln sales in the automotive industries.

COMBUSTION ENGINEERING

William B. Senseman has been appointed Pacific Coast District Manager for Combustion Engineering Corporation, Raymond Bros. Impact Pulverizer Co., Ladd Water Tube Boiler Co., and Heine Boiler Co., all subsidiaries of International Combustion Engineering Corporation.

Mr. Senseman has been associated with Raymond Bros. Impact Pulverizer Co. for the past fifteen years and since 1917 has represented that organization on the Pacific Coast.

The new consolidated offices are located in the Subway Terminal Building, 417 South Hill St., L.A.

R. B. LEA PROMOTED

Announcement has been made by The Sperry Gyroscope Company of the appointment of R. B. Lea as assistant sales manager of the company. He will also continue as manager of the Marine Department. Mr. Lea became associated with the Sperry Company immediately after leaving Cornell in 1915 and has had experience in nearly all departments of the company. He has a large acquaintance among marine people throughout the world.

Royal D. Malm

Marine Insurance

Edited by JAMES A. QUINBY

Seaworthy Certificates by Underwriters' Surveyors

THERE is a wide-spread misconception of the true value of any survey report, and the difficulty is greatly increased where the surveyor is acting for an underwriter on hull or cargo, or on behalf of a board of underwriters. If you ask the man on the street he will tell you that so long as he has a certificate of a Board surveyor that the vessel insured is seaworthy on the inception of the risk, the insurer is precluded from denying such proper stowage or seaworthiness. The insurer replies that the survey report is merely evidence—that it isn't necessarily conclusive proof. The M.O.T.S. naturally asks, in his turn, if that's so, what's the blinkin' bally good of such certificates?

A survey report is only the opinion of an individual, and no matter how good that individual is, there is always a chance that the facts may disagree with him. Until we reach the millennium of human omniscience, there will always be a place for at least two expert witnesses in every case—one on each side. And if they are surveyors, each of them has probably written an impressive report attesting the facts and cause of the damage involved. To assume that either report is correct would not help the situation; to assume that both are correct is impossible.

THE DUTCH COMPANY

There are phantom ships whose names still ring
In long-forgotten ports,
Whose pilots hold their weary course
Through Federal Reports.
Their hatches bulge with precedents
That courts of law have made;
A fleet of Flying Dutchmen
Whose names will never fade.

They rim our mental horizon
With tops'ls sheeting down,
The West Aleta, Charlemagne,
The good ship Turret Crown,
The North Star and the Strathdon,
All tight and snug below,
The Osceola, Roanoke,
The staunch Willdomino.

The Jason and the Yucatan,
The schooner Catherine,
The Irrawaddy, Baltimore,
Wordsworth and Ellaline,
The Carib Prince, the Clandeboye,
The ill-starred Sarpedon,
The Manitoba, Sarnia,
The J. P. Donaldson.

The Star of Hope, the Sandringham,
Our old friend Inchmaree,
Zealandia, Gregorios,
The famous Tennessee.
We can't forget the Rensselaer,
And eke the Celtic Chief,
For ships are famed for many things
But these are famed for grief.

J. A. Q.

The report of any surveyor, therefore, is open to correction by proof of fact. This shortcoming, however, should not lead us to a hasty condemnation of all surveys. Underwriters, either singly or in combination, have done more than any other group to improve the conditions of shipping. The reports of underwriters' surveyors are valuable—perhaps slightly more valuable than the reports of other surveyors in certain cases—but they are not conclusive, nor do they operate to prevent an underwriter from showing the true facts involved.

In New Orleans, Texas and Mexico Railway Company v. Union Marine Insurance Company, 1923 A.M.C. 183, the Circuit Court of Appeals for the Fifth Circuit held that a certificate of seaworthiness issued by the New Orleans Board of Underwriters and required by the terms of cargo policies effected by the carrier as bailee of cargo, did not deprive the insurer of his defense based upon actual unseaworthiness.

"The principal defense made by the insurers," says the court, "was that the barge was unseaworthy and that the loss occurred by reason of this condition which relieved them of liability.

"The libellant replies that the usual warranty of seaworthiness was waived in this case by the requirement of the insurers that the barges employed should hold certificates of the New Orleans Board of Underwriters.

"The District Court found on the facts that the barge was unseaworthy, and on that ground held the insurers not liable.

"The libellant relies on the case of Western Assurance Co. vs. Southern Cotton Oil Co., 68 Fed. 924, as establishing the position that a certificate of inspection by such board will estop its members from questioning the seaworthiness of a vessel insured by a member. The certificate issued in that case was furnished at the time of the insurance to the assured. It was an absolute certificate of the seaworthiness of the vessel made but a short time before with no qualifications or reference to the warranty of seaworthiness. In the present case, the certificate is made on March 18th. The risk attached on June 8th. This certificate certifies that the cargo is for one year entitled to the rate of premiums specified for the barge 'if maintained in seaworthy condition,' and also that the 'certificate does not guarantee seaworthiness or waive the guaranty of seaworthiness or its continuance.' Had such a certificate been furnished to the assured in the case in 68 Fed., it would have been advised by the terms of the certificate that no waiver of the guaranty of seaworthiness was made by its issuance, and the decision in that case would not probably have been to the effect that the insurer by furnishing such cer-

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MARINE DEPARTMENT—*Harry W. Browne, Manager*
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FRANK G. TAYLOR, MANAGER, PACIFIC NORTHWEST BRANCH

tificate waived such guaranty.

"In this case there is no contention that any express waiver of the guaranty of seaworthiness was made, but only a requirement that the barges to be used should hold certificates. In policies where the law will imply generally a warranty of seaworthiness, it can only be excluded by terms in writing in the policy in the clearest language. Arnould on Marine Insurance, Sec. 686.

"But whether the policies contained such an implied warranty or not, we do not think that the loss covered in this case is within the perils insured against by them.

"An insurance policy only insures against the perils named in the contract of insurance. Fawcus v. Sarsfield, 6 El. & Bl. 192, 204.

"Here the evidence shows that no peril of the river, but the unseaworthiness of the barge, caused the loss. Unquestionably, the barge sank from water entering through open seams.

"The evidence preponderates in favor of the finding of the District Court that the seams above the water line had been opened by the hot sun, and the oakum therein was loose or had fallen out entirely, thus causing her to fill with water when in the course of loading these seams were forced below the water line, and that the loss occurred by reason of this unseaworthy condition."

Tea For Three

McGuire, the red-headed export man of the Pan-Oceanic Trading company, was lunching with his underwriter and with Porter, operating manager of the Pink Funnel Line. They were dividing their attention between generous segments of Gus' open-faced pies, and the problems confronting a trader on the West Coast of South America. As between the two—pies and the West Coast—it's an open question which has done the most to ruin the constitution of Pacific Coast Underwriters.

"It's the old story," said McGuire, throwing his hands outward in a sharp gesture. "Latin-America is one of the best markets we have. Her people use, per capita, five times as many of our manufactured articles as do the people of Asia. And yet our trade and shipping conditions with the West Coast are rotten. Every shipment that goes in there is either rifled by pilferers, or dropped overboard from the slings. Oh, I know I'm exaggerating somewhat, but it gets my goat."

"Well," drawled Porter, "What's the use of getting all worked up about it? I'm sure our boats do the best they can. Why don't you insure?"

"I do insure. Ask Carson here. He's been paying my bum losses for two years now, and he's getting tired of it. I don't blame him. Even at the rate I'm paying him, he must be progressing like the frog in the well, one step forward and two backward. I expect to have him cancel my policy at any time."

The underwriter looked seriously at the bottom of his coffee cup.

"No, Mac," he said, slowly, "I'm not going to cancel, but I am going to tighten up on your proofs of loss. I've been paying a lot of stuff that wasn't properly supported. Documents with a lot of blue and red ribbons on 'em, signed by the Capitan del Puerto about six months after the loss, saying that a terrific mirajada tipped over the lighter."

"Yes, I know it." McGuire turned on him savagely. "You can't get 'em to do any better. I've been through it with three other insurance companies in the last ten years. Your settling agents up and down the coast are either competitors of the carriers or competitors of our exporters, or both. The only way you could beat the game would be to send your own representatives down there, and the damned country would get in their blood, sooner or later, and you'd be just where you started."

The steamship man shifted uneasily in his chair, and observed that the others were getting unduly excited, and that conditions were probably no worse than in other trades.

"That's all very well from your point of view," said Carson. "You don't lose anything. One of your boats heaves to off Mollendo and a covey of stevedores flocks aboard, each one with an empty sack over his shoulder. And for what? And then——"

"But they carry their working clothes in those sacks——"

"Yeah! Tell little Pollyanna another one! What do they carry when they leave the ship? Of course, when there's a checkup, the loss on the individual shipment is usually so small that we can't afford to fight it out. But in the aggregate——"

"Now see here, Carson," said Porter, "We do the best we can. My line pays every claim that you can show us we're responsible for. That's all you can ask, with the P. and I. market the way it is. If we paid everything we'd go broke, and then who'd carry your little two by four shipments of sardines to Juan Hernandez?"

"Yes, you do the best you can," broke in McGuire, "but your men aren't always so careful. I've been down there. The Jap and German boats always have a quartermaster on duty at the gang-way. On an American

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309 COLMAN BUILDING, SEATTLE, WASHINGTON

ship, a stranger can climb aboard and roam all over the thing."

"That's not true," said Porter hotly. "We keep a watch on our boats. And we keep a watch on each hold where stevedores are discharging."

"Well," said McGuire, "I guess we can't do anything about it. If we could only get the people down there to do something. The merchants in those ports are honest. Why can't some pressure be brought to bear on them?"

"We might have an agreement among all the carriers not to call at certain ports for a specified time," suggested Carson, "and sort of force them to improve."

"Bunk," snapped McGuire. "The carriers can't even keep an intercoastal rate agreement. What you insurers ought to do, Carson, is to get together and make it impossible to get pilferage insurance until——"

"Bunk," mimicked Porter. "The underwriters are too busy cutting rates to agree to anything."

"Ho-hum," sighed McGuire as they rose. "You're both probably right."

And so they paid their bill and left. And they are still paying the West Coast couvert charge.

The underwriter pays in losses.

The shipowner pays in higher P. and I premiums.

And McGuire pays a higher premium to cover his goods.

Latent Defects In Jewelry?

There seems to be no limit to the guises in which the well-known latent defect may appear to haunt the peaceful dreams of unsuspecting underwriters. The latest report of the scourge comes from an unexpected quarter—the sovereign state of Minnesota.

The North River Insurance Company issued to Mrs. Bessie C. Chute an all-risk jewelry policy, covering

"——jewelry (being articles of personal adornment), and/or on furs as per schedule attached, against all risks of loss or damage during transportation (including all risks of loss or damage caused by breakage, fire and theft) or otherwise, except as hereinafter provided."

An opal in one of the pieces of jewelry so covered became cracked during the currency of the policy, and the insurer refused to pay for replacing it. Mrs. Chute sued the company in the Superior Court of Minnesota, alleging in her complaint that the crack was "due to some inherent cause inherent in said opal, and was not the result of outside force."

It was argued by the insurer that this pleading did not state a cause of action, since inherent vice in the article insured was not a loss covered by the policy, and that Mrs. Chute's case should fail, the assured's burden of proving a loss under the policy not having been met.

It was further pointed out on behalf of the defendant company that marine policies, even when they contain the Inchmaree Clause, have been held to exclude losses arising throught a latent defect becoming patent. In this connection, defendants cited the well-known English cases of Stott Steamers v. Martin 85 L.J.K.B. 97, and Hutchins Bros. v. Royal Exchange Assurance Corporation L.R. 1911, 2 K.B. 398. It will be remembered that the latter case concerned a flaw in the sternpost of the steamer Ellaline, which was concealed by the builders and later exposed. The court there refused to allow a recovery under the Inchmaree Clause of the hull policy, holding that there had been no accident, but merely the discovery of an existing defect.

The insurers also relied upon the later American case of the Rennselaer (Borland v. Standard Marine Insurance Company, 211 N.Y.S. 348; 1925 A.M.C. 1116) in which a New York court followed the Ellaline decision in a case involving the breakage of a shaft.

In the face of this authority, the plaintiff contended that all risks of whatever nature on jewelry were covered under the policy, since as to another class of property covered—watches—there was a specific exclusion of internal damage. It was argued by inference that internal damage to precious stones was intended to be included under the policy.

It was also pointed out by the assured that the cases above cited were all marine insurance cases, and therefore had no bearing on a jewelry risk.

The court, however, supported the contention of the defendant, and held that as the damage was due to inherent defect, there was no liability under the policy. The case is now on appeal to the Supreme Court of Minnesota.

Overheard on California Street

"——and I called up Ed, and what'y think—this burglar had been over there, too, tryin' to peddle his bum risk all over town."

"——it looked good, but I know more about peanuts now. Why, if you were to offer me——"

"Now this friend of mine is a surveyor, and he gets his stuff right off the incoming boats."

"——too bad the State of Louisiana isn't a houseboat. This flood business would make a wonderful G.A. You know, sacrifice for the common benefit, imminent peril, and all that. Allowance to Hoover for being shot at——"

Balfour, Guthrie & Company
(Established 1869)

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INSURANCE

BROKERS FOR THE ASSURED—AVERAGE ADJUSTERS

"I know of an outfit that writes all risks on galvanized sheets."

"This friend of mine is an engineer on one of the big boats, and he gets his stuff——"

"Well, I know it was bum underwriting, but I thought I'd get some other business out of it, and so——"

"——and when there's a loss, he's on hand at daylight with his declaration——"

"——This friend of mine is a pilot. and——"

HOW HEAVY IS HEAVY WEATHER?

In the Leerdam, 1926 A.M.C. 509, the Circuit Court of Appeals for the 5th Circuit recently dealt rather harshly with two of the shipowner's pet defenses, i.e. heavy weather and due diligence.

A cargo of chalk was damaged by water while in transit from Antwerp to New Orleans. The ship claimed exemption under a clause in its bill of lading by which, under Section 3 of the Harter act, its duty as to seaworthiness was limited to due diligence. Relying on the exercise of such diligence, the ship contended that the damage must have been caused by heavy weather, a peril of the sea for which the vessel is not liable. The Court, however, thought otherwise.

"The Leerdam," so runs the opinion, "was a new ship. On her first voyage, rough weather was encountered, and some water damage to the cargo was caused by the breaking of rivets in the cabin bulkhead forward and in the main deck. Upon the completion of that voyage, a survey was held. The surveyor states in a most general way that it was thorough, but he fails to state what was actually done. Within a few days after that survey, the second voyage was begun, on which appellee's cargo was shipped; and on it the Leerdam again encountered rough weather, but not more severe than was reasonably to be expected on the Atlantic at that season of the year. In order to steady the ship, the forepeak tank was filled with sea-water, which leaked through a rivet hole in the bulkhead into hold No. 1 where appellee's cargo was stored. No missing rivet was found, and it is uncertain whether there ever was one in the rivet hole through which the water leaked. A subsequent examination failed to disclose any evidence of weakness or straining about the bulkhead or elsewhere.

"The burden of proving that due diligence has been used to make a vessel seaworthy is upon the ship owner. Wildcroft, 201 U.S. 378. That burden is not sustained by evidence of a superficial inspection, Southwark, 191 U.S. 1; nor where the evidence is so indefinite that it is impossible to determine that any real inspection was made. The evidence in this case is wholly unsatisfactory, and is consistent with the inference that no test whatever was made or undertaken. Due diligence to make a vessel seaworthy must in fact have been exercised. It is not sufficient for a ship owner to show that he had employed competent men to do the work, but he is held responsible for the failure of the men he employs. In the absence of evidence that due diligence was exercised by appellant or its agents, there is no means of determining whether there was a defective rivet which was forced out or lost, or whether the rivet hole had been left open from the beginning.

"We do not think that the weather was shown to be rough enough to be considered a peril of the sea. It could well have been foreseen as one of the ordinary incidents of the voyage.

"The decree is affirmed."

LYMAN STEWART CARGO CLAIMS

It is a far cry from that foggy afternoon in October 1922 when the ill-fated Lyman Stewart crashed into the Walter A. Luckenbach in the Golden Gate, and yet the legal gentry have not yet completed the last rites of the famous case.

Although settlement for the loss of the "Stewart" herself is still awaiting a determination of her provable value, the owners and insurers of her cargo have now obtained their recovery. Messrs. Derby, Single, and Sharp, representing the Shell Oil Company, recently accepted a check for $233,061.25 in

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of London

Union Marine Ins. Co., Ltd.

Norwich Union Fire Ins. Society, Ltd.

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(Marine Department)

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Phone Douglas 6313

settlement of their claim, while $49,945.02 was paid to other cargo interests.

As a result of the length of time which has elapsed since the collision, a respectable proportion of this settlement is chargeable to interest.

Safety Equipment for Ships

A SUB COMMITTEE organized under the general supervision of the technical comimttee on Ship Operation Details and Supplies of the American Marine Standards Committee recommends in addition to those now required by law the following items which in their judgment provide the utmost practicable safety under present conditions. All of the items mentioned being obtainable in various types and makes in the open market are open to competition and none of them involves expenditure disproportionate to benefits derived from their judicious and appropriate use. This list has been approved by the American Marine Standards Committee for general information and reference.

Safety in Navigation

Gyroscopic Compass—The safety of a ship is enhanced, and the accuracy of navigation increased, under all conditions, by the installation of the true north gyroscopic compass of recognized effective type.

Signal Receiving Apparatus—The installation of either a radio compass or submarine sound receiving apparatus, or both, is regarded as contributing materially to the safety of ocean-going vessels.

Automatic Depth Sounding—The installation of some recognized effective type of automatic depth sounding apparatus makes possible an increase in efficiency of navigation and adds to the safety of the ship.

Fire Protection

Fire Detection Systems—Passenger and crews quarters, also cargo spaces, should have fire detection systems of recognized effective types, so installed as to give indication and location of a fire in its early stages.

Fire Extinguishing Systems—(1) The fire rooms of vessels using oil for fuel should have fire extinguishers of the foam type, of adequate capacity and conveniently located for instant use, or fire extinguishing systems of approved type so designed and installed as to be operated from outside of compartment. Engineer officers and fire room crews should be fully instructed in regard thereto. (2) Much damage to cargoes would be prevented by the installation in cargo holds of simple piping systems for delivery therein of carbon dioxide or similar gas to smother a fire. This is recommended in lieu of water or steam systems which are no more economical in first cost, are not as effective and cause unnecessary damage when used.

Fire Screen Bulkheads—The safety of life and protection of property would be materially enhanced by constructing proper fireproof bulkheads or other means to keep fires isolated.

Personal Welfare and Safety

Alarm Signal Devices—Adequate arrangements either electrical or mechanical should be provided in refrigerator spaces to enable persons in danger of being overcome or inadvertently locked therein, to give an alarm signal for rescue.

Safety Guards—The gauge glasses of the boilers should be provided with safety guards to prevent the scattering of pieces when they break under pressure.

Shaft Alley Escape—Easy means should be provided for opening the upper exit door from inside at all times.

Life Lines—The proper location of life lines for all conditions of service should be diagrammed and appropriate fittings should be installed to effectively secure them. Those responsible for the placement and use of such lines should be instructed with respect to their proper installation and securing. Claims for damages based on improperly secured life lines are frequent and would be largely eliminated by following this practice.

Safety Devices — The operating gears of maneuvering valves of turbines especially, should be so designed with interlocking devices as to effectively prevent erroneous handling and consequences.

Markings for Passageways and Exits—Adoption of a standard system of direction markings to guide persons to exits to facilitate escape in case of fire or other emergency is recommended.

Ventilation of Quarters—The living quarters on all vessels should be adequately ventilated but on motor vessels the subject should be given special consideration in view of the risk of pervasion of gas.

Emergency Provisions

(a) Gas Masks or Breathing Apparatus — Ocean-going vessels especially those carrying oil as cargo, or for fuel, should be equipped with breathing apparatus for use by persons entering spaces in which there is fire, or in which the oxygen content of the air is likely to be consumed, or deficient to sustain life. Vessels using ammonia ice machines, or carrying cargo liable to create dangerous atmospheric mixtures should be equipped with suitable all purpose canister gas masks (or equivalent of) types approved for the required service by the United States Bureau of Mines. The location of such equipment should be generally made known and all persons liable to require its use should be instructed and drilled in the use thereof.

(b) Metal Cutting Outfit—Distortion of the steel structure in cases of collision may imprison persons whose release can be effected only by cutting parts of the metal structure, and such cases would require quick action. For such emergencies an approved cutting outfit would be desirable equipment.

On vessels in which electrical current is distributed and assured with reasonable certainty under all circumstances, such may consist of an electrical outfit.

On vessels equipped with air compressors, such may consist of hand-operated compressed air tools provided that there is a compressed air piping system with outlets for convenient hose connections and sufficient air hose to reach the essential parts of the ship. A compressed air tool outfit would also serve the purpose on vessels having no stationary air compressors, by providing a suitable portable motor-driven air compressor.

Such may also consist of an oxy-acetylene burning outfit but when this is carried it should be stowed in a location readily accessible and unsusceptible to wide variations in temperature and secured in a manner ensuring safe stowage but permitting easy removal. It should be under the charge of members of the ship's personnel competent to use it, either from actual experience or by special instructions.

The purpose of carrying any such outfit on the vessel should be made known to all of the ship's officers.

American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Shipbuilding Work in Prospect

BIDS CALLED FOR CUTTERS

Bids will be opened June 21 at the office of the U. S. Coast Guard, 14th & E. Streets, N. W., Washington, D.C., for the construction of five Coast Guard cutters, Nos. 45, 46, 47, 48, and 49. The vessels are to be of steel hull construction, with the following characteristics:

Length, over-all . . . . 250′ 0″
Beam, molded . . . . 42′ 0″
Displacement, 15 ft. mean draft, about 2075 tons.
Turbo-electric drive, single screw.
Shaft horsepower 3000

Appropriations have been made by Congress which will cover the entire cost of three vessels and partial cost of the remaining two. It is therefore specified that three vessels must be completed on or before October 31, 1928, and the remaining two six months later, at the option of the builder. Turbo-electric machinery for the first three vessels has already been placed with the Westinghouse Electric & Manufacturing Company. For the last two vessels, contract for the machinery to be furnished by the government will not be awarded until after July 1, 1927. Bidders have the privilege of bidding on all five vessels with Westinghouse machinery and equipment installed, or an alternative but similar equipment for the last two vessels.

TENDERS INVITED FOR CANADIAN SHIPS

The Canadian National Railways, with headquarters in Montreal, has issued details of the requirements for five new steamers for their West Indies service. Five Canadian shipyards have been asked to submit bids. It is confidently believed that at least two of the five vessels will be built in Canada, rumors being to the effect that part of the order will be placed in Great Britain.

The shipbuilding firms asked to submit their bids by June 15 are: Halifax Shipyards Ltd.; Canadian Vickers, Ltd., Montreal; Davie Shipbuilding Co., Lauzon, Quebec; Burrard Dry Dock Co., Vancouver; and Yarrows, Ltd., Victoria.

The boats will have a cargo capacity of about 3000 tons, with special provision for 70,000 stems of bananas, and for the carriage of fresh fruits in cold storage. Accommodations will be provided for 100 first class, 30 second class, 50 third class, and 50 deck passengers.

The company also has under consideration the conversion of the Canadian Fisher and Canadian Forester to oil burners and fitted with refrigeration for 50,000 stems of bananas.

SHIPPING BOARD CONSIDERS RECONDITIONING PROPOSALS

Proposals for the reconditioning of the laid up government vessels, Mt. Vernon and Agamemnon, now at Norfolk, Virginia, were considered by the United States Shipping Board on May 10 and subsequently turned over to a committee of the body for further study.

The plans, submitted by the Newport News Shipbuilding and Drydock Company and by the Winchester-Gibbs shipping interests of New York included three separate proposals for the rebuilding of the Mt. Vernon, at estimated cost of $2,500,000, for restoration as a coal burner; $3,000,000 as an oil burner; and $6,000,000 as an electric driven vessel with turbine engines.

A committee consisting of Commissioners W. S. Benson, E. C. Plummer and Jefferson Myers was designated by Chairman O'Connor to give further study to the proposals.

TWO MAIL BOATS FOR ALASKA

Governor George A. Parks of Alaska has issued a call for bids on the construction of two mail and passenger boats for Alaskan service. Each must have accommodations for twenty passengers, one to be of 40 tons capacity and the other of 30 tons capacity.

The Steamship Comfort, formerly an Army transport and now owned by the General Metals Supply Co., Oakland, Calif., was recently put on drydock at the Alameda Plant of the Bethlehem Shipbuilding Corp. for survey. The liner may be purchased by the Ward Line and equipped for Atlantic coastwise passenger service.

W. F. Gilder, an engineer of 853 Pittock Block, Portland, Oregon, will design and construct the St. Johns ferryboat to cost $50,000 for Multnomah County Supervisors.

The Shipping Board has sold the freighter Absaroka to the McCormick Steamship Company of San Francisco. The price was $131,000, with the condition that the vessel be converted into an oil burner.

Three of the vessels purchased from the Shipping Board by the Ford Motor Company for scrapping will be converted to barges. About $125,000 will be spent on the conversion of the vessels. They are of the Lake-type and were purchased for $8530. An additional sum of $10,000 for each ship will be paid to the Shipping Board in the event the Ford Company decides to go through with the work.

Proposals for the construction of a steel ferryboat for the U. S. Army were opened on May 2 at the office

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of the Quartermaster Corps. Governors Island, New York. The boat will be for service between New York City and Governor's Island. Alternate bids were asked on direct diesel drive and diesel-electric drive. Principal characteristics are:

Length over guards	128′ 0″
Length on 9′ 6″ water line	118′ 0″
Breadth over guards	44′ 0″
Breadth on 9′ 6″ waterline	34′ 0″
Molded depth	15′ 2″
Draft	8′ 6″

The location for the building of the vessel is not restricted, as the War Department will take delivery at builder's yard wherever located.

Recent Shipbuilding Contracts

Baker Construction Company, Portland, Oregon, has been awarded contract by the Portland City Council for the construction of three fireboats at a cost of $150,711, this being the lowest bid. Separate order has been placed with the Sterling Engine Company for four Viking type gasoline engines for each boat, to cost $97,000; and with the Byron-Jackson Pump Mfg. Co. for pumps to cost $29,979. Construction will start the first part of June.

The boats will be 85 ft. 11 in. long, 5ft. 6 in. draft, and will each have a total horsepower of 1980.

Bethlehem Shipbuilding Corp., Ltd., has been awarded contract for the conversion of the tanker Tuxpanoil from steam to diesel drive. The engines to be installed have been constructed by the Falk Corporation of Milwaukee. They consist of two 8-cylinder, 4-cycle units coupled to two pinions of a reduction gear, with a total of 2600 shaft horsepower. They are of the single-acting, medium compression, airless injection, heavy duty type. A great deal of interest has been taken in this order due to the fact that reduction gear drive is to be used. The Bethlehem bid was $179,000 for the work.

Yoneda Shipyards, Victoria, B. C., has an order for five seine boats for the Albion Fish reduction & Oil Refining Co., to cost about $150,000.

Marine Iron & Ship Building Co., Duluth, Minn., has contract from the commissioner of Canals and Waterways of the New York Barge Canal, Syracuse, N.Y., for six steel dump scows to cost $119,700.

Erie City Iron Works, Erie, Penn., has an order from the Commissioner of the New York Barge Canal, Thomas F. Farrell, for four steel flat deck scows to cost $40,650.

Prince Rupert Drydock and Shipyard, Prince Rupert, B.C., has an order from P. Bruno for a 54-foot halibut fishing boat.

American Bridge Co., Pittsburgh, has an order from J. K. Davison & Bro. for five sand barges to be 135 by 27 by 7 ft. 6 in.

Marietta Manufacturing Co., Point Pleasant, W. Va., has an order for two stern wheel towboats and eight steel hoppered cargo barges for the Magdalena River, Colombia. The towboats will be 168 ft. long and the barges 125 ft. long.

Sun Shipbuilding Co., Chester, Pa., has an order for two carfloats for the Pennsylvania Railroad.

Ellicott Machine Corporation, Baltimore, Maryland, has received a contract from the General Purchasing Officer of the Panama Canal Committee, Washington, D.C., for the construction of a 24-inch diesel-electric suction dredge on a bid of $1,042,600. The dredge will be 226 feet long, 50 feet beam, and 14 feet depth. She will be powered with four 900-horsepower, 4-cycle Fulton engines and Westinghouse generators and auxiliaries.

J. C. Johnson's Shipyard, Port Blakely, Wn., has an order from Thomas Jacobson of Seattle for a 64-foot boat, no particulars available.

The Moore Dry Dock Company, Oakland, Calif., has been awarded a contract by the Southern Pacific Co., of San Francisco, for a steel carfloat to cost about $150,000.

William Muller, Wilmington, Calif., has an order for three additional rock barges for the Wilmington Transportation Co.

American Brown - Boveri Electric Corp., Camden, N.J., has an order for two carfloats from the Pennsylvania Railroad, to be 185 by 34 by 9 ft. 6 in. This plant has also received contract from the U. S. Navy Department for the completion of the scout cruiser Salt Lake City and machinery for the scout cruiser Pensacola, in addition to contract for an additional scout cruiser under bids opened April 5, 1927.

Dravo Contracting Co., Pittsburgh, Pa., has an order from the International Petroleum Company of Toronto for six covered oil barges for the Magdalena River, steel decks, to be 100 by 30 by 6 ft. 6 in.; also an order from the U. S. Engineers, Pittsburgh, for three complete maneuver boats; also they are building five floating caissons for their contracting department.

Defoe Boat and Motor Works, Bay City, Mich., has a contract to build a yacht for E. T. Strong of Flint, Mich.; to be 57 ft. long and powered with 200 I.H.P. gas engines.

Federal Shipbuilding & Drydock Corp., Kearny, N.J., has an order for four carfloats from the Pennsylvania Railroad.

Staten Island Shipbuilding Co., Mariner's Island, N.Y., has an order from The Foundation Company for four caissons of steel and wood construction.

American Shipbuilding Co., Cleveland, have received a contract from the Standard Oil Company of Indiana for a steel tanker, 390 long, 52 feet beam, 25 feet depth. This company has an order for two barges for the Standard Oil Co. (N.Y.)

KEEL LAYINGS

Seine fishing boat for Gammon & Watts by Prince Rupert Drydock and Shipyard, Mar. 1; halibut fishing boat for P. Bruno on Apr. 1.

Carfloat for Lehigh Valley Railroad by Federal Shipbuilding & Drydock Co., Apr. 18.

S. T. Crapo, bulk cement freighter for Huron Transportation Co. by Great Lakes Engineering Works, Apr. 12.

Wharf boat for Dubuque, Iowa, by Marietta Manufacturing Co., May 1.

Four deck barges by Nashville Bridge Co.

Steel twin-screw diesel yacht for Henry J. Gielow, Inc., New York, by The Pusey & Jones Co., Apr. 1.

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Diesel-electric ferryboat for Dept. of Plant & Structure, City of New York, by Todd Drydock, Engineering & Repair Corp., Apr. 14.

LAUNCHINGS

Two cannery tenders for Sunny Point Packing Co. by J. C. Johnson's Shipyard, Apr. 21.

Maltha, tow barge for Union Oil Co. by Hanlon Drydock & Shipbuilding Co., Apr. 30.

H. F. Harvey, bulk freighter for Pittsburgh Steamship Co. by Great Lakes Engineering Works, Apr. 9.

Two steel barges for W. C. Kelly Barge line by The Chas. Ward Engineering Works, Apr. 20 and May 9; Duncan Bruce, stern-wheel towboat for W. C. Kelly Barge Line, May 2.

Shawnee, passenger and freight steamer for Clyde Line by Newport News Shipbuilding & Drydock Co., Apr. 18.

Golden Shore, diesel-electric ferryboat for the Golden Gate Ferry Co., by General Engineering & Drydock Corp. Apr. 30.

Redwood Empire, diesel-electric ferryboat for Northwestern Pacific Railroad, by The Moore Dry Dock Co., Apr. 30.

DELIVERIES

Fresno, double-end, diesel-electric ferryboat for Southern Pacific Co. by Bethlehem Shipbuilding Corp., San Francisco, Apr. 23.

Selig No. 1, fish scow for Capt. Steve Selig, by J. C. Johnson's Shipyard, Mar. 24.

Simba, cruiser for Stewart Edward White by Lake Washington Shipyards, in May; fishing boat for Dick Suryan, in Apr.

Yerba Buena, diesel-electric passenger ferryboat for Key System Transit Co. by The Moore Dry Dock Co., Apr. 30.

Tugboat for Granby Consolidated Mining, Smelting & Power Co. by Prince Rupert Drydock & Shipyard, Apr. 24; Signal, halibut boat for M. J. Iverson, Apr. 23.

One derrick boat hull for T. Smith & Son, Inc., New Orleans, by American Bridge Co., May 4; four coal barges for Carnegie Steel Co. in Apr.

Eleven steel motor patrol boats for U. S. Coast Guard by American Brown Boveri Electric Corp. during Apr.

Northern Light, schooner yacht to John Borden of Chicago by W. F. Stone & Co., May 1.

Jno. M. Milliken, motor dredge for Gulf Refining Co. by Charleston Drydock & Machinery Co., in May.

Gulfpride, tanker for Gulf Refining Co. by Federal Shipbuilding & Drydock Co., Apr. 9.

Traveler, diesel ferryboat for Tri-State Ferry Co. by Howard Shipyards & Dock Co., Apr. 17; two steel guide docks for E. T. Slider, New Albany, Apr. 6 and 19.

Steel sand and gravel dredge hull for E. T. Slider, New Albany, Ind., by Midland Barge Co., May 15.

Northland, cutter to Coast Guard by Newport News Shipbuilding & Drydock Co., May 5; oil barge to U. S. War Dept., Apr. 12.

America, grain elevator for Inter. Elevating Co. by Staten Island Shipbuilding Co., Apr. 15.

Gulfsprite, twin screw motor tank barge for Gulf Refining Co. by Sun Shipbuilding Co., Apr. 20.

NEW ATLANTIC REFINING TANKERS SOON IN SERVICE

The diesel-electric machinery is now being installed in the three tankers soon to be put in service by the Atlantic Refining Company. These boats were purchased last year from the U. S. Shipping Board.

They are the Sharon, J. M. Connally, and Bessemer, each of 7000 tons deadweight. The J. M. Connally is being outfitted at the Point Breeze plant of the Atlantic Refining Company, Philadelphia, and will probably go into service by the latter part of June. The other two boats are being reconditioned by the Alabama Drydock & Shipbuilding Company at Mobile, and will probably be in service sometime during July or August.

The power plants on each boat will consist of Ingersoll-Rand diesel engines and electric equipment furnished by the General Electric Company.

The tankers will be fitted with electric auxiliaries, all of which will be driven by General Electric motors.

RIVER BOATS COMPLETED

The de luxe river steamers Delta King and Delta Queen have been completed at the Stockton shipyards of the California Transportation Company of San Francisco. The boats go into regular service between San Francisco and Sacramento on June 1.

They are declared to be the most palatial inland waterway craft in the world and cost about $1,000,000 each. The boats each measure 286 feet in length, 58 feet beam, and 16 feet 6 inches depth. Each boat has accommodations for 234 passengers and 40 automobiles in addition to freight. They have four decks, including the main deck. Special features include hot air and cold air ventilating systems, staterooms with twin beds, showers, tubs, and the usual equipment of the finest hotel rooms. The dining room will seat 94 people at one time. Public rooms consist of a large observation room, a large social hall, and men's club or smoking rooms.

The B. C. Fishing and Packing Co., Ltd., of Vancouver, British Columbia, has been given a permit to erect a marine ways, slip, and machine shop at the Celtic cannery on the north arm of the Fraser River, Point Grey, to cost $20,000.

Canada Steamship Lines, Ltd., has ordered two passenger steamships to be built at the Davie Shipbuilding Co., Lauzon, Quebec, one to replace the Montreal, burned last year, and one to replace the Quebec. The new boats will be slightly larger than the St. Lawrence now under construction at the same yards. They will have accommodations for about 500 passengers and 800 tons of freight. Engines are being built in England.

The underlying companies of Cramp-Morris Industrials, Inc., which was formed recently to take over the six subsidiaries of the William Cramp & Sons Ship and Engine Building Company when the parent company decided to discontinue shipbuilding, have been extending their operations in the manufacture of diesel engines, castings, hydraulic and other machinery.

CUTTER NORTHLAND

The first United States Coast Guard cutter to be equipped with diesel-electric drive, the Northland, was given her trials on April 26. The boat was built by the Newport News Shipbuilding & Drydock Company. She will be placed in service in Alaska waters to replace the historic cutter Bear.

The power plant of the Northland consists of two main generators, two auxiliary generators mounted on shaft extensions of the main generators, and three independently driven auxiliary generators. The main generators are driven by McIntosh & Seymour diesel engines and the three auxiliary generators by engines of Winton and Cummins manufacture. Practically all electrical equipment was supplied by the General Electric Company.

The Northland is 216 feet long, 39 feet beam, 24 feet 9 inches draft, and will have a speed of 12 knots.

The Ballard Marine Railway Company of Seattle recently launched a diesel powered tug for the Hawaiian Dredging Company of Honolulu. The tug will be used in connection with the $5,000,000 dredging contract for Pearl harbor improvement. The tug Saretta is 60 feet long, 14 feet 10 inches beam, and 7 feet draft. She is powered with a 120-horsepower Fairbanks-Morse diesel engine and was designed by Coolidge and Hansen of Seattle.

The same yard is building a tender for the Hawaiian Dredging Company to transport dredging crews. She will be 40 feet long and powered with a 65-horsepower gas engine.

The Winslow Marine Railway and Shipbuilding Company of Winslow, Washington, recently completed the Puget Sound ferryboat Quillayute for the Sound Ferry Lines, Inc., of Edmonds. The boat is of wooden construction, with accommodations for 50 automobiles and 500 passengers. She is 160 feet long, 52 feet beam, and 13 feet 9 inches draft. Two Washington-Estep diesel engines of 375 horsepower each gave her a speed on trials of 12.5 knots. She was designed by M. MacNaught of Seattle.

(Continued on Page 300)

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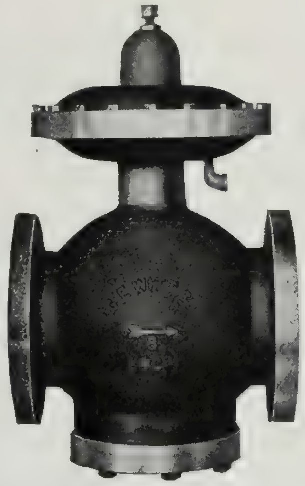

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Purchasing Agent: O. W. Streett.

Fresno, hull 5331, double-end diesel-electric vehicular ferryboat for Southern Pacific Co., San Francisco; 256′ L.O.A.; 44′10″ beam; 19′ depth; four Nelseco diesel engines. 450 H.P each; keel Nov. 8/26; launched Jan. 15/27; **delivered April 23/27.**

Stockton, hull 5332, sister to above; keel Nov. 20/27; launched March 5/27; deliver May 15/27 est.

Mendocino, hull 5333, for Northwestern Pacific Railroad, sister to above; keel Jan. 20/27; launched Apr. 14/27; deliver June 5/27 est.

GENERAL ENGINEERING & DRY-DOCK CO.,

Alameda, California

Purchasing Agent: Al. Wanner.

Golden Bear, hull 3, diesel-electric wooden auto ferry for Golden Gate Ferry Co.; 240′ L.B.P.; 44′ beam; 11′ 6″ loaded draft; 13 knots speed; 3-400 B.H.P. Ingersoll-Rand diesel engines, direct connected to Westinghouse generators; keel Oct. 28/26; launched Feb. 2/27.

Golden Poppy, hull 4, sister to above; keel Nov. 22/26; launched Apr. 2/27.

Golden Shore, hull 5, sister to above; keel Feb. 4/27; **launched Apr. 30/27.**

Santa Rosa, hull 6, diesel-electric, steel automobile ferryboat for Southern Pacific Co.; 236′ L.B.P.; 44′ 10″ beam; 12′ 6″ loaded draft; 13 knots speed; 4-450 B.H.P. Nelseco diesel engs. connected to General Electric generators; keel Oct. 28/26; launched Mar. 17/27.

J. C. JOHNSON'S SHIPYARD

Port Blakely, Wn.

Hull 95, cannery tender for Sunny Point Packing Co., Seattle; 75 by 17 ft.; **launched Apr. 21/27;** deliver May 5/27 est.

Selig No. 1, hull 96, fish scow for Capt. Steve Selig, Ketchikan, Alaska; 60 by 18 by 4ft.; **delivered Mar. 24/27.**

Hull 106, cannery tender and towboat for Sunny Point Packing Co., Seattle; 75x17 ft.; **launched Apr. 21/27;** deliver May 5/27 est.

Ruth May, hull 110, trolling boat for Mike Mathison, Port Blakely, Wn.; 45x6x4 ft. 6 in.

Hulls 113-114, two fish scows for Sunny Point Packing Co., Seattle; 62x18x4ft. 6 in.

Hull 116, boat for Thomas Jacobson, Seattle; 64′x 15′x7′4″.

HANLON DRYDOCK & SHIP-BUILDING CO.

Oakland, Calif.

Maltha, hull 91, tow barge for Union Oil Co.; 100 L.B.P.; 40 beam; 7ft. 6in. loaded draft; keel Feb. 21/27; **launched Apr. 30/27;** deliver May/27 est.

LAKE WASHINGTON SHIPYARDS.

Houghton, Wash.

Purchasing Agent: A. R. Van Sant.

Simba, cruiser for Stewart Edward White, 58 feet L.B.P.; 65 H.P. Washington-Estep diesel eng.; keel Oct. 11/26; launched Feb. 10/27; **delivered May/27.**

Fishing boat for Dick Suryan, 65 ft. long; 65 H.P. Washington-Estep diesel engine; **delivered Apr. 27.**

LOS ANGELES SHIPBUILDING & DRY DOCK CORPORATION

San Pedro, Calif.

Barge No. 1, hull 53, oil barge for California & Eastern Oil Co., Los Angeles; 131 L.B.P.; 40 beam; 9-6 loaded draft; 1050 D.W.T.; keel Dec. 27/26.

THE MOORE DRY DOCK COMPANY

Oakland, California.

Secretary and Purchasing Agent, Nat Levy.

Yerba Buena, hull 171, double-ended screw propelled ferryboat for Key System Transit Co.; **256 L.B.P.; 47 molded beam; 21 molded depth; 14.5 normal speed; turbo-electric propulsion; water-tube** boilers; keel May 3/26; launched Nov. 22/26; **delivered Apr. 20/27.**

Lake Tahoe, hull 172, diesel-electric, steel, vehicular ferryboat for Southern Pacific Company; **236′ L.B.P.; 44′10″ beam 12′6″ loaded draft; 13 knots speed; 1250 S.H.P. Nelseco diesel engs.; connected** to Westinghouse generators; keel Dec. 8/26; launched March 23/27.

Redwood Empire, hull 173, sister to above; keel Dec. 8/26; **launched Apr. 30/27.**

PRINCE RUPERT DRYDOCK AND SHIPYARD

Prince Rupert, B.C.

One 75-foot tugboat for Granby Consolidated Mining, Smelting & Power Co.; 120 H.P. Washington-Estep diesel eng.; launched Feb. 3/27; **delivered Apr. 24/27.**

Signal, halibut boat for M. J. Iverson; 58′ L.O.A.; keel Feb. 1/27; launched Apr. 4/27; **delivered Apr. 23/27.**

Seine fishing boat for Gammon & Watts; 64 ft. long; **keel Mar. 1/27.**

Halibut fishing boat for P. Bruno; 54 ft. long; **keel Apr. 1/27.**

W. F. STONE & SON

Oakland, Calif.

Purchasing Agent: Lester Stone.

No name, motor cruiser, for stock, 36x10x3½ ft.; 12 mi. speed; 65-HP. gas engines.

Northern Light, hull 824, yacht for John Borden; 140 L.B.P.; 30 beam; 14 loaded draft; 10 mi. speed; 360 I.H.P. diesel engs.; keel Sept. 1/26; launched Jan. 19/27; **delivered May 1/27.**

Aloha, hull 828, yacht for Frank B. Drake; 55 L.B.P.; 13 beam; 6 loaded draft; **7 mi. speed;** 30 I.H.P. gas eng.; keel Aug. 25/26 deliver May 1/27 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY

Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Two towboat hulls for Carnegie Steel Corp., Pittsburgh; 149′ 2″ x 33′ 4″ x 5′ 10-5/16″; one delivered.

One derrick boat hull for T. Smith & Son, Inc., New Orleans; 110′x50′x10′; keel laid; **delivered May 4/27.**

30 coal barges for Carnegie Steel Co.; 175x26x 11 ft.; **8 delivered.**

Five barges for Rodgers Sand Co.; 135x27x 7ft. 6in.

Five sand barges for J. K. Davison & Bro.; 135′ x27′x7′6″.

AMERICAN BROWN-BOVERI ELECTRIC CORP.

Camden, N. J.

Purchasing Agent: L. G. Buckwalter.

Hull 338, steel motor patrol boat for U. S. Coast Guard, Washington, D.C.; 125 L.O.A.; **23′6″ molded beam;** 220 tons displacement; **Winton diesel** engs.; keel Dec./26; launched Mar./27; **delivered Apr./27.**

Hull 339, same as above; keel Dec. /26; launched Mar./27; **delivered April/27.**

Hull 340, same as above; keel Dec. /26; launched Mar./27; **delivered April/27.**

Hull 341, same as above; keel Dec./26; **delivered Apr./27.**

Hull 342, same as above; keel Dec./26; **delivered Apr./27.**

Hull 343, same as above; keel Dec. /26; **delivered Apr./27.**

Hull 344, same as above; keel Feb. 1/27; **delivered Apr./27.**

Hull 345, same as above; keel Feb. 1/27; **delivered Apr./27.**

Hull 346, same as above; keel Feb. 1/27; **delivered Apr./27.**

Hull 347, same as above; keel Feb. 1/27; **deliver-**

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ed Apr./27.

Hull 348, same as above, keel Feb. 1/27; **delivered Apr./27.**

Hull 349, same as above, keel Feb. 1/27.

Hull 350, same as above: keel Feb./27.

Hull 351, same as above: keel Feb./27.

Hull 369, carfloat for Reading Co., capacity 8 cars; keel winter/27 est.

Hull 370, carfloat for Brooklyn Eastern Dist. Terminal, 340x38x11ft.; capacity 23 cars; keel Mar./27; launch and deliver June/27 est.

Hull 371, carfloat for Pennsylvania R.R. Co.; 185'x34'x9'6".

Hull 372, same as above.

THE AMERICAN SHIP BUILDING COMPANY

Cleveland, Ohio.

Purchasing Agent: C. H. Hirsching.

Wm. McLauchlan, hull 793, bulk freighter for Pickands, Mather & Co.; 580 L.B.P.; 60 beam; 20 loaded draft; 13 mi. loaded speed; 12,000 D.W.T.; T.E. engs.; 2400 I.H.P.; 3 B. & W. boilers 200 lbs. pressure; keel July 19/26; launched Oct. 7/26; deliver Apr. 15/27 est.

Robert Hobon, hull 794, sister to above keel Aug. 9/26; launched Oct. 30/26; deliver Apr. 15/27 est.

L. E. Black, hull 795, bulk freighter for Inland Steel Co.; 596 L.B.P.; 64 beam; 20 loaded draft; 13 mi. speed; 13,500 D.W.T.; T.E. engs.; 2700 I.H.P.; 3 Scotch boilers, 24'6"x11'x185 lbs.; keel Nov. 8/26; launched Feb. 1/27; deliver Apr. 15/27 est.

Geo. M. Humphrey, hull 796, bulk freight steamer for Kinsman Transit; 580 ft. L.B.P.; 60 ft. beam; 20 loaded draft; 13 mi. speed; 12,000 D.W.T.; triple expansion engs.; 2500 I.H.P.; 3 Scotch boilers, 14x11; 159 lbs. pressure; keel Oct. 18/26; launched Dec. 30/26. deliver April 15/27 est.

Carl D. Bradley, hull 797, self-unloading bulk freighter for Bradley Transport. Co.; 615 L.B.P.; 65 beam; 20 loaded draft; 14 mi. speed; 13,000 D.W.T.; turbo-electric drive; 4000 I.H.P.; 2 water tube boilers; 325 lbs. pressure; keel Jan. 10/27; **launched Apr. 9/27;** deliver July 1/27 est.

Harry Coulby, hull 798, bulk freighter for Pickands, Mather & Co.; 607' L.B.P.; 65' beam; 33' loaded draft; 13 mi. speed; 13,800 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 B. & W. boilers; 200 lbs. pressure; keel Feb. 7/27; launch Apr. 23/27 est.; deliver July 1/27 est.

Not named, hull 799, tug for Michigan Limestone & Chemical Co., 83'6" L.B.P.; 24 beam; 12 draft; 12 mi. speed; compound engs. 900 I.H.P.; 1 fire tube boiler, 160 lbs. pressure; keel Mar. 1/27 est.; launch Apr. 9/27 est.; deliver May 1/27 est.

Not named, hull 800, bulk oil barge for Standard Transportation Co.; 258 L.B.P.; 40 beam; 10 draft; keel Mar. 21/27 est.; launch July 13/27 est.; deliver July 27/27 est.

Not named, hull 801, oil barge for Standard Transportation Co., sister to above; keel Mar. 21/27 est.; launch July 13/27 est.; deliver July 27/27 est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT

Quincy, Mass.

Lexington, hull 1300, airplane-carrier U.S.N., launched Oct. 3/25.

Hull 1402, carfloat, N.Y., N.H. & Hartford R.R.; 360'x40'x11'6"; 1375 gro. tons; keel July 14/26.

Hull 1403, carfloat, same as above; keel July 15/26.

Hull 1404, carfloat, same as above; keel July 16/26.

Hull 1405, carfloat, same as above; keel July 16/26.

Hull 1406, oil barge for City Service Transport Co. 204'x35'6'x14'3".

CHARLESTON DRY DOCK AND MACHINERY COMPANY

Charleston, S. C.

Purchasing Agent: Charles R. Valk.

Jno. M. Milliken, motor dredge for Gulf Refining Co.; 95'x30'x8'; 400 H.P. De La Vergne diesel engs.; keel Oct. 11/26; launched Dec. 7/26; **delivered May/27.**

CONSOLIDATED SHIPBUILDING CORPORATION

Morris Heights, N. Y.

Hull 2867, cruiser for George G. Bourne; 81x14 ft. 6 in.; 2 Wright Typhoon engs., 550 H.P. ea.

Hull 2868, cruiser for Geo. F. Baker, Jr.; 70 x 12 ft. 6 in.; 2 Model R. Speedway engs., 300 H.P. each.

Hull 2870, cruiser for H. N. Slater; 60x10 ft. 10 in.; 2 Model M.R. Speedway engs.; **180 H.P.** each.

Hull 2872, cruiser for B. H. Borden; 95 x 16 ft.; 2 Model R Speedway engs., 300 H.P. ea.

Hull 2874, cruiser for Clifford V. Brokaw; 85x14 ft. 6 in.; 2 Model R. Speedway engs. 300 H. P. each.

Hull 2875, cruiser for Adolph Dick, 54x11 ft. 6 in.; 2 Model M.R. Speedway engs., 180 H.P. ea.

Hull 2877, cruiser for E. W. Clark; 50x10; one Model M.R. Speedway eng., 180 H.P.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.

Philadelphia, Pa.

Purchasing Agent: Ed. C. Geehr.

Malolo, hull 509, express psgr and frt liner, Matson Navigation Co.; 582 LOA; 577 length at water line; 83 ft beam; depth molded to C deck 54 ft.; displacement 22,050 tons; **8250 DWT;** speed 22 knots regular, 23 knots **maximum; 25,000 shaft horsepower; Cramp-Parsons turbines; oil burning B & W water-tube boilers; keel May 4/25;** launched June 26/26; deliver June 1/27 est.

Yarmouth, hull 518, twin screw passenger and freight **steamer** for Eastern **Steamship Lines;** 378 **length at water line; 55-6 beam; 29-6 molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.;** two **Parsons turbines with** reduction gears, **six single-ended** Scotch boilers; keel Feb. 23/26; launched Nov. 6/26; deliver June 10/27 est.

Evangeline, hull 524, twin screw passenger and **freight steamer** for Eastern **Steamship Lines; 378** length **at** water line; 55'6" beam; **29'6" molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears; 6 single-ended Scotch** boilers; keel May 1/26; launched Feb. 12/27; deliver July 1/27 est.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

Purchasing Agent: G. O. Williams.

Comoco, hull 122, steel yacht for R. W. Judson, Detroit; 140' L.B.P.; 23'6" beam; 8'9" loaded draft; 15 mi. speed; 260 D.W.T.; 600 I.H.P. diesel engs.; keel Dec. 15/26; launch May 21/27 est.; deliver June 1/27 est.

Helen, hull 121, steel yacht, for Chas. E. Sorensen, Detroit; 105 L.B.P.; 17' beam; 6' loaded draft; 13 mi. speed; 110 D.W.T.; 200 I.H.P. diesel engs.; keel Nov. 1/26; launch May 24/27 est.

Grathea II., hull 124, yacht for E. T. Strong, Flint, Mich.; 57'x13'x4'; 13 mi. loaded speed; 22 D.W.T.; 200 I.H.P. gas engs.; keel Aug. 1/27 est.; launch and deliver Apr. 1/28 est.

DRAVO CONTRACTING COMPANY

Pittsburgh, Pa.

Hulls 501 and 502, 2 steel barges for stock; 230 **x45x11 ft.; 650. gro tons ea.**

Hull 534, 1 ladder type sand and gravel dredge for Pittsburgh Plate Glass Co.; 155x44x8ft., 430 gross tons.

Hulls 537 and 538, two steel whirler boat hulls for Contracting Dept.; 40x48x5'6"; 100 gro. tons.

Hulls 540-543 inc.; 4 steel barges for Keystone Sand & Supply Co.; 135'x27'x8'; 320 gro. tons ea.

Hull 553-566 inc., 14 steel barges for Mississippi River Commission, Memphis; 120'x30'x7'4"; 430 gro. tons ea

Hulls 577-578, 2 dump scows for Pittsburgh Plate Glass Co.; 110x26x8 ft. 6in.; 220 gro. tons. ea.

Hull 579, steam dredge for Ohio River Gravel Co.; 120 x 32 x 6 ft.; 200 gro. tons.

Hull 580, steel hull "A" frame derrick boat for Pittsburgh Plate Glass Co.; 72 x 34 x 5 ft.; 120 gro. tons.

Hulls 581-590 inc., 10 standard steel barges for stock; 100x26x6 ft. 6 in.; 135 gro. tons each.

Hulls 591-600 inc., 10 standard steel barges for stock, 100x26x6ft. 6in.; 135 gross tons each.

Hulls 601-604 inc., 4 steel barges for Keystone Sand & Supply Co.; 135x27x8ft.; 320 gr. tons ea.

Hulls 605-612 inc., 8 steel barges for Keystone Sand & Supply Co.; 135 x 27 x 8ft.; 320 gr. tons each.

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California

Hull 613, steam dredge for stock; 2 cu. ft. capacity; 120x32x6ft.

Hull 614, one diesel engine towboat for stock; 110x26x5 ft.; 215 gro. tons.

Hulls 615 and 616, two 120-H.P. stern wheel diesel towboats for stock; 74ft. 2in. x 16 ft. x 4 ft.; 320 gro. tons ea.

Hulls 617 and 618, two steel barges for Ohio River Sand Co.; 130 x 30 x 7 ft. 6 in.; 25 gro. tons ea.

Hulls 619 and 620, two pontoon-type whirler boat hulls, in 4 sections; each 10 x 40 x 4 ft. 6 in.; for Contracting Department; 92 gro. ton ea.

Hulls 621-626 inc., six covered oil barges, steel decks, for International Petroleum Co., Montreal; 100'x30'x6'6"; 180 gro. tons ea.

Hulls 627-631 inc., five floating caissons, for contracting dept.; 39'x18'10"x11'; 77 gro. tons ea.

Hulls 632-634 inc., three complete maneuver hulls for U.S. Engineers, Pittsburgh; 93 gro. tons ea.

DUBUQUE BOAT & BOILER WORKS
Dubuque, Iowa

Purchasing Agent: A. L. Yehger.

Two steel dump scows for U.S. Engineers, Louisville, Ky.

Thorpe, river towboat for Upper Mississippi Barge Line Co. & Inland Waterways Corp.; 132'x35'x3'6"; stern wheel, tandem comp. surface condensing engs.; 15"x30"x78" stroke; keel Oct. 1/26 est.; launch Mar. 1/27 est.; deliver Apr. 1/27 est.

Weber, river towboat, sister to above; keel Oct. 1/26 est.; launch Mar. 1/27 est.; deliver Apr. 1/27 est.

Morse, river towboat, sister to above; keel Oct. 1/26 est; launch Mar. 1/27 est; deliver Apr. 1/27 est.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent: R. S. Page.

Gulfpride, hull 86, tanker for Gulf Refining Co.; **525' L.B.P.; 74' beam; 28' loaded draft; 11 knots speed; 17,400 D.W.T.; 4500 I.H.P. diesel engs.:** keel June 15/26; launched Jan. 20/27; **delivered Apr. 9/27.**

Dixie, hull 89, passenger and freight steamer **for Southern Pacific Steamship Lines, Pier 49, North River, New York; 427 L.B.P.; 60 beam; 25'6" loaded draft; 6700 D.W.T.; De Laval steam turbines; 7700 S.H.P.; 4 B. & W. boilers, 21,900 sq.** ft. heating surface; 16,000 sq. ft. superheating surface; keel Jan. 31/27.

Hull 90, carfloat for Lehigh Valley Railroad; 278 x39x10ft.; **keel Apr. 18/27.**

Hull 91, same as above.

Hull 92, same as above.

Hull 93, carfloat for D. L. & W. Railroad, 278 x39x10 ft.

Hull 94, same as above.

Hull 95, same as above.

Hulls 96-99 inc., four carfloats for the Pennsylvania Railroad

GREAT LAKES ENGINEERING WORKS
River Rouge, Mich.

Purchasing Agent: Chas. Short.

H. F. Harvey, hull 256, bulk freighter for Pittsburgh Steamship Co., Cleveland; 580 L.B.P.; 60 beam, 20 loaded draft; T.E. engs.; 2200 I.H.P.; 3 Scotch boilers 12' diam by 11'6", keel Jan 3/27, **launched Apr. 9/27;** deliver May 30/27 est.

S. T. Crapo, hull 256, bulk cement freighter for Huron Transportation Co.; 385 L.B.P.; 60 beam; 19 loaded draft ;11 mi. speed; 7200 D.W.T.; T.E. engs.; 1800 I.H.P.; 3 Scotch boilers, 12 ft. 9 in. diam.; **keel April 12/27;** launch Aug 1/27 est.; deliver Oct. 1/27 est

HOWARD SHIPYARDS & DOCK COMPANY
Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hull 1599, steel guide dock for E. T. Slider, New Albany Ind.; 120'x24'x4'; keel Feb. 28/27; **launched Apr. 4/27; delivered Apr. 6/27.**

Hull 1600, same as above; keel Mar. 1/27; **launched Apr. 18/27; delivered Apr. 19/27.**

Hull 1601, hull for Baton Rouge Car Terminal, Baton Rouge, La.; 285'x60'x9'6"; keel Mar. 30/27; launch June 1/27 est.; deliver July 15/27 est.

Traveler, hull No. 1603, diesel ferryboat for Tri-State Ferry Co., Cairo, Ill.; 100 L.B.P.; 30' beam; 5' depth; 9 mi. loaded speed; 125 D.W.T.; 6-cyl. diesel eng.; 180 I.H.P.; keel Jan. 3/27; launched Mar 14/27; **delivered Apr. 17/27.**

Hulls 1605-1625, 20 steel barges for U. S. Army Engineers, St. Louis; 55 x 16 x 3 ft.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Purchasing Agent: H. Meyer.

Hull 227, one car ferry for Grand Trunk Milwaukee Car Ferry Co.; 360' L.O.A.; 58' molded beam; 21'6" depth; 2 T.E. engs.; 4 Scotch boilers; launch Jan. 19/27 est.; deliver Mar. 1/27 est.

MARIETTA MANUFACTURING COMPANY
Point Pleasant. W. Va.

Purchasing Agent: S. C. Wilhelm.

Thirty steel discharge pontoons for U.S. Army Engineers, Rock Island, Ill.; 38'x14'x3'2"; 6 launched.

One steel stern-wheel towboat for Magdalena River, Colombia; 168' x 42' x 5'; tandem compound engs.; keel laid; deliver July 1/27 est.

Wharf boat for city of Dubuque, Iowa; 214x45x6ft. 6in.; **keel May 1/27.**

Wharf boat for Minneapolis; 214x45x6ft. 6in.; keel May 15/27 est.

Wharf boat for St. Paul, 214x45x6ft. 6in.; keel May 30/27 est.

Two stern-wheel towboats for Magdalena River, Colombia; 168'x42'x5'.

Eight steel hoppered cargo barges for Magdalena River, Colombia; 125'x26'x6'

MIDLAND BARGE COMPANY
Midland, Pa.

Fifteen barges for Inland Waterways Corporation, 126'x33'x7'6"; **14 launched; 13 delivered.**

Steel sand and gravel dredge hull for E. T. Slider, New Albany, Ind.; 175'x50'x6'; keel March 1/27; **launch and deliver May 15/27.**

Four barges for West Virginia Sand & Gravel Co.; 100x26x6ft 6in.; keels May 15/27 est.; deliver July 1/27 est

One dredge hull for River Sand Co.; 131x30x5ft.

One hull for Geo. Martin; 130x32x5ft.

Four sectional dry-docks for International Petroleum Co. of Montreal; 70x44 ft.

One steel flush deck barge for Dillman Egg Case Co.; 180'x36'x7'.

MIDLAND SHIPBUILDING COMPANY, LTD.
Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

City of Hamilton, hull 18, package freighter for Canada Steamships, Ltd.; 230 L.O.A.; 38 beam; 23 depth; T.E. engs.; keel Oct. 11/26; launched Jan. 12/27; deliver May 16/27 est

City of Montreal, hull 19, package freighter same as above; keel Oct. 11/26; launched Jan. 12/27; deliver May 16/27 est.

Saskatoon, hull 20, package freighter for Canada Steamship Lines, Ltd.; 250 L.B.P.; 42 beam; 26ft 6in draft, keel Jan. 18/27; launch May 18/27 est

Weyburn, hull 21, sister to above; keel Jan. 15/27; launch May 18/27 est.

NASHVILLE BRIDGE COMPANY
Nashville, Tenn.

Purchasing Agent: Leo E. Wege.

Hull 108, dredge, owner not named; clam shell bucket type, 110'x51'6"x8'; steam eng.; keel June 15/27 est

Hulls 113 to 118 inc., deck barges for stock, 3 **keels laid.**

Hull 119, deck barge, for stock; 130x34x8 ft.; **keel Apr. 27/27;** launch May/27 est

Hull 120, deck barge, for stock; 130x34x8 ft.; keel May 5 est.; launch May/27 est.

Hull 121, deck barge for stock; 140 L.B.P.; 32 beam; 6 loaded draft; keel June 5/27 est.; deliver Aug. 1/27 est.

Hull 122, deck barge same as above.

Hull 123, deck barge same as above.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas: Plummer, 233 Broadway New York City.

Iroquois, hull 306, passenger and freight **steamship for Clyde Steamship Company, New York, 407'-3" overall, 62'-0" beam, 30'-6" depth, Newport News turbines and gear; 8500 I.H.P.; Scocth** boilers; oil burning; keel March 20/26; launched Dec. 11/26; deliver May/27 est.

Shawnee, hull 307, sister to above; keel May 15/26; **launched April 18/27.**

California, hull 315, 18-knot, passenger liner **for Panama Pacific Line, New York; 600 ft. long, 80 ft. beam, 52 ft. depth; watertube boilers for oil 22,000 gross tons; 17,000 I.H.P.; keel Mar. 20/26;** launch Aug./27 est.

Northland, hull 318, coast guard cutter for **U. S. Government; 216' long; 39' beam; 24'9" draft; diesel-electric** propulsion; McIntosh & **Seymour engs.;** keel Aug. 16/26; launched Feb. 5/27; **delivered May 5/27.**

Caracas, hull 319, passenger and freight steamer for Red D Line, New York; 335'4" L.O.A.; 51' beam; 22' draft; Newport News turbines and gears; water-tube boilers; 3560 D.W.T.; 4000 S.H.P.; keel Nov. 18/26; launch June/27 est.

Hull 320, oil barge for U. S. War Dept.; 80x26x5ft.; keel Feb. 21/27; **launched and delivered Apr. 12/27.**

Hull 321, barge for Merritt, Chapman and Scott Corp.; 154x50x13 ft.; keel May/27 est.

THE PUSEY AND JONES CORP.
Wilmington, Del.

Purchasing Agent: James Bradford.

Not named, hull 1031, single screw passenger **freight steamer for Baltimore & Philadelphia Steamboat Co., Philadelphia; 219 L.B.P.; 45 beam; 11 loaded draft; 14½ mi speed; 4 crank, TE engs. 21-32-35-35 by 24"; two B. & W. water-tube** boilers, 3046 sq. ft. heating surface each.

Peter Stuyvesant, hull 1033, steel single screw day steamer for Hudson River Day Line, New York; 252 L.B.P.; 46 beam; 4-cycle, triple expansion engs.; 2800 I.H.P.; 4 B. & W. water-tube boilers; 11x12 200 lbs. pressure; keel Sept. 15/26; launched Feb. 2/27, deliver May 20/27 est.

Not named, hull 1034, steel twin-screw diesel yacht from Henry J. Gielow, Inc., naval architect, New York, 294' L.O.A.; 38'3" beam; 16' loaded draft; 2 Bessemer diesel engs.; total of 3000 H.P.; **keel Apr. 1/27.**

STATEN ISLAND SHIPBUILDING COMPANY
Mariner's Harbor, N. Y.

Purchasing agent: R. C. Miller.

America, hull 769, grain elevator for Inter. Elevating Co.; **130 L.O.A.; 35 beam; 9 loaded draft forward,** 11 loaded draft aft; diesel engs.; keel Sept. 30/26; launched Jan. 27; **delivered Apr. 15/27.**

Secony 1, hull 774, steam tug for Standard Transportation Co.; 100 ft. 2 in. L. B.P.; 24ft. 1in. beam; 12ft. 3in. depth; 15 knots speed; comp. engs. 850 I.H.P.; 1 Scotch boiler 14ft. 9in. dia. by 12ft.; keel Mar. 8/27; launch May 18/27 est.; deliver Aug. /27 est

Socony 5, hull 775, steam tug, sister to above; keel Mar. 15/27; launch May 25/27 est.

Hulls 777-780, four caissons for The Foundation Co. for Lower Hackensack Bridge, New Jersey; steel working chambers and timber construction; deliver Apr., May, June, and Sept./27 est.

SUN SHIPBUILDING COMPANY
Chester, Penn.

Purchasing Agent: H. W. Scott.

Gulfsprite, hull 102, twin screw motor tank barge for Gulf Refining Co.; **136'x27'x11'6"; 400** B.H.P. engs.; to carry 385 tons on 9' draft; 9 kts. speed; keel Dec. 2/26; launched Feb. 26/27; **delivered Apr. 20/27.**

Tydal, hull 103, twin screw motor tank barge for Tidewater Oil Co.; **252' long; 40' beam;** 14' depth; to carry 1885 tons on 12' draft; 10 kts. speed; keel Jan. 3/27; launch Apr. 9/27 est.; deliver May 5/27 est.

Not named, hull 104, single screw bulk oil steamer for Tidewater Oil Co.; 480' long; 65'9" beam, 37 feet depth; to carry 13,000 tons on 27'6" draft; speed 11½ knots; keel March 1/27; launch Aug. 15/27 est.

Colonial Beacon, hull 105, motor barge for Beacon Oil Co., Boston; 255'6"x40'x15'; two 360 H.P. Fairbanks-Morse diesel engs.

Not named, hull 106, motor tanker for Sun Oil Co.; 480'x65'9"x37'; 13,000 D.W.T.

Not named, hull 107, tanker for California Petroleum Co.; 510'x70'x40'; 17,000 D.W.T.

Hull 108, carfloat for Pennsylvania Railroad.

Hull 109, same as above.

TOLEDO SHIPBUILDING CO.
Toledo, Ohio.

Purchasing Agent: Otto Hall.

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Wabash, hull 177, car ferry for Wabash Ry. Co.; 388 L.B.P.; 57'6" beam; 16' loaded draft; 13½ mi. speed; 2500 D.W.T.; T.E. engs.; 2500 I.H.P.; 4 Scotch boilers, 14'6" diam.; keel Nov. /26; launch Mar. 19/27 est.; deliver Apr. /27 est.

B. F. Affleck, freighter, hull 178, for Pittsburgh Steamship Co.; 580 L.B.P.; 60' beam; 19' loaded draft; 12½ mi. speed; 12,500 D.W.T.; T.E. engs.; 2500 I.H.P.; 3 Scotch boilers; 14' diam; keel Feb. 1/27.

TODD DRYDOCK & ENGINEERING REPAIR CORP.

Brooklyn, N. Y.

Purchasing Agent: H. J. Shannon.

No name, hull 40, diesel-electric ferryboat for Dept. of Plant & Structures, City of New York; 101 ft. 6 in. length over guards; 27 ft. 7 in. beam; 6 ft. 8¾ in. loaded draft; 300 I.H.P. Nelseco diesel engine; **keel Apr. 14/27.**

No name, hull 41, diesel-electric ferryboat, sister to above; **keel Apr. 14/27.**

THE CHARLES WARD ENGINEERING WORKS

Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Hull 55, steel barge for W. C. Kelly Barge Line; keel Jan. 3/27; launched March 13/27.

Hull 56, same as above; keel Mar. 7/27; **launched Apr. 20/27.**

Hull 57, same as above: keel Mar. 22/27; **launched May 9/27.**

Hull 58, same as above.

Hull 59, same as above.

W. A. Shepard, hull 60, towboat for W. C. Kelly Barge Line; screw propeller, 2 Fairbanks-Morse diesel engs.; 720 B.H.P.; keel Sept. 23/26; launched Jan. 11/27; deliver Mar. 15/27 est.

Duncan Bruce, hull 61, stern-wheel towboat, for W. C. Kelly Barge Line; **135'x35'x6'; Fairbanks-**Morse diesel engs.; keel Jan. 17/27. **launched May 2/27.**

Not named, hull 62, diesel powered stern wheel survey boat for Mississippi River Comm., Dredging Dist., Memphis, Tenn.; 139'6"x24'x5'3".

Repairs

BETHLEHEM SHIPBUILDING CORP., UNION PLANT

Potrero Works, San Francisco

Drydock, paint, misc. repairs: Corvus, Iowan, Stuart Dollar, Richlube, Sierra, Algonquin, President Grant, J. A. Moffett, Necanicum, Point Reyes, Montanan, Geisha, Wilhelmina, Lansing, Finland (repairs account of damage), Star of Falkland, San Diego, Bandon, Haviside Barge No. 2, Cadaretta, Cleone, Port Saunders, Hawk, Hercules, Traveler, Martha Beuhner, Cahokia. Misc. engine repairs: Invincible, J. C. Fitzsimmons, Makena, Petroleum No. 3. Boiler repairs: Shabonee. Engine and boiler repairs, deck and steward's: City of Los Angeles. Propeller repairs: Bandon, Carlos, extras for Sonoma and Ventura, Corvus, Chuky. Pipe repairs: Barge No. 6, West Ivan. Tail shaft repairs and replacements: Chilbar, Lurline, Manoa, Matsonia, Wilhelmina, Ohioan, Prentiss, La Placentia. One set turbine blading: President Lincoln: Renew two upper sections of smokestack: Daisy. Repair dynamo: Maliko. 1 starboard wildcat with bronze bushing: Daisy Putnam. Telemotor repairs: D. G. Scofield. Misc. repairs: Panaman, President Garfield, Providencia, Mongolia, China Arrow, Ohioan, D. G. Scofield, Barge No. 6, Corvus, W. S. Miller, Willfaro, American, Santa Cecilia, Virginian, San Pedro, Waiotapu, Avon, West Calera, Maui, Willzipo, Georgian, Finland, Missourian, Daisy, Santa Inez, San Diego, Quinault, Florence Olson, Comfort, Maunawili, Maliko, San Diego, Nora, Francis E. Powell, Suspearco, Cathwood, Montpelier, Tahchee, Montebello, Nordanger, Astoria, Storsten, Fearless, Crenatula, Emidio, Mendocino, Satanta, Tascalusa, Sugarseco, West Ivan, Lahaina, Myriam, Socony, Oleander, John D. Archbold.

CHARLESTON DRY DOCK AND MACHINERY CO.,

Charleston, S. C.

Drydocked and repairs: stmrs. Coldwater, Tulsa, Schoharie. Hauled out on ways and repaired: yachts Pilgrim II., Summer Girl, Sally Jean V., Avalanche, Elizabeth, Vigilant, Trail, houseboat Everglades, snag boat Wateree, pilot Tha'd Street, dredges Augusta, J. M. Milliken, Chinese junk Amoy, launches Charlie, Ever-May, tug Mars, lighter

GENERAL ENGINEERING AND DRY DOCK COMPANY,

Alameda, Calif.

Remodel from passenger to combination passenger and automobile ferry, drydock, clean, paint, the Golden Era (ex Fernwood). Drydock, clean, paint: m.s. Beulah (two new tail shafts, damage repairs), s.s. Vanguard (general repairs, new tail shaft), Unimak (general repairs, new wheel), Golden City (general repairs), fireboats Dennis T. Sullivan and David Scannell (general repairs), Noyo (general damage repairs), yacht Idalia, dredge Long Beach (hull repairs), Bretagne (general repairs), Coquina (general repairs), Henrietta (pull tail shaft, rivet staybolts).

HANLON DRYDOCK & SHIPBUILDING CO.,

Oakland, Calif.

Purchasing Agent: R. Barker.

Drydock, cleaned, painted: stmrs. Doylestown, Northland, Dewey, Meton, Angel Island, Glacier, Mala, Slocum, schrs. Beulah, Thistle, bktn. Moshulu, m.s. City of Nome.

LAKE WASHINGTON SHIPYARD,

Houghton, Wash.

Drydock and overhaul seven whaling boats for the American Pacific Whaling Co., misc. drydocking and repairs.

U. S. NAVY YARD,

Bremerton, Wash.

Drydocking and decommission: Huron. Drydock and repair: Tennessee, Robert Smith, Meyer. Misc. repairs incidental to operation as district craft: Mahopac, Swallow, Challenge, Pawtucket, Sotoyomo, Tatnuck.

PRINCE RUPERT DRY DOCK AND SHIPYARD,

Prince Rupert, B.C.

Docked, cleaned, painted, misc. hull repairs: Dom. Govt. Dept. Marine Hydrographic scow, floating cannery Laurel, 17 fishing boats (also machinery repairs). Lined for grain, stmr. Kofuku Maru. Misc. hull and machinery repairs: 32 fishing boats. 63 other commercial jobs.

TODD DRY DOCKS, INC.,

Harbor Island, Seattle, Wash.

General repairs and overhauling: H. F. Alexander, yacht Aquilo. Drydock and misc. repairs: stmr. Catherine D. Dock, clean, paint: ferry City of Tacoma, stmr. Oduna. Deck repairs: Alaska Standard. Deck and engine repairs: Border King. Boiler room repairs: Heiyei Maru. Engine room repairs: Loch Monar. Stern frame repairs, etc.: Pomona. Draw tail shaft for examination: Romulus. Docked for survey: West Camargo. Misc. repairs: Admiral Evans, Admiral Farragut, Admiral Watson, Cacique, Charles R. McCormick, Chippewa, Pacific Pine.

(Continued from Page 295)

The Pacific Coast Engineering Company at Oakland, California, now has under construction an eight cubic yard dipper dredge. This is for the Hawaiian Dredging Company of Honolulu, who have a contract for the dredging of Pearl Harbor. The dredge is 125 feet long, 42 feet breadth, and 12 feet 6 inches depth. All machinery will be installed before the dredge is towed to the Islands.

Keel for the U. S. Submarine V-5 was laid at the Portsmouth Navy Yard on May 10. The design of the V-5 embodies the latest developments in all branches of submarine technology. Keel for her sister ship, the V-6, will be laid at the Mare Island Navy Yard in July or August.

The Westminster Marine Railway Co., Ltd., at New Westminister, British Columbia, is building a self-propelled barge for the delivery of fuel oil and gasoline to British Columbia ports. The barge is being built for Armson & McIntosh of Vancouver. She will be 86 feet long, 20 feet beam, and 11 feet molded depth. She is to be of wooden construction with six large steel cargo tanks. Power plant will consist of a 6-cylinder, 4-cycle Washington-Estep directly reversible diesel engine, which will give an estimated speed of 8½ knots.

According to an announcement just received from the American Brown Boveri Electric Corp., John F. Metten, for many years vice-president and chief engineer of Wm. Cramp & Sons Ship & Engine Building Company, will join the staff of the former company. Wm. Cramp & Sons recently announced that they would withdraw from the shipbuilding business with the completion of vessels now under construction.

REPAIR AWARDS

Bethlehem Shipbuilding Corp., Ltd., San Francisco, has contract, on a bid of $26,000, for repairs to the Hartwood Lumber Company's steamer Point Arena. The boat is to be reconditioned for sale to the General Steamship Corp., who will use her in the Cuban sugar trade.

Mare Island Navy Yard is reconditioning U. S. Army transport Grant. The vessel is also being converted into an oil burner.

Garbutt & Walsh, boat builders at terminal Island, San Pedro, have a contract for rebuilding of the schooner yacht Mabel Dell to accommodate new diesel engines. The yacht was recently purchased by John Gilbert from a Canadian owner. The work will cost between $20,000 and $30,000.

Hanlon Drydock & Shipbuilding Co., Oakland, Calif., has been given contract by the U. S. Shipping Board for repairs to the freighter West Togus to condition her for active service. Low bid was $23,821.

Los Angeles Shipbuilding & Drydock Corp. were awarded contract for repairs to the Norwegian steamer Karlfarli on a low bid of $10,195. A new windlass will be installed and deep tanks repaired.

Ship in American Ships

KEEP THE DOLLAR AT HOME

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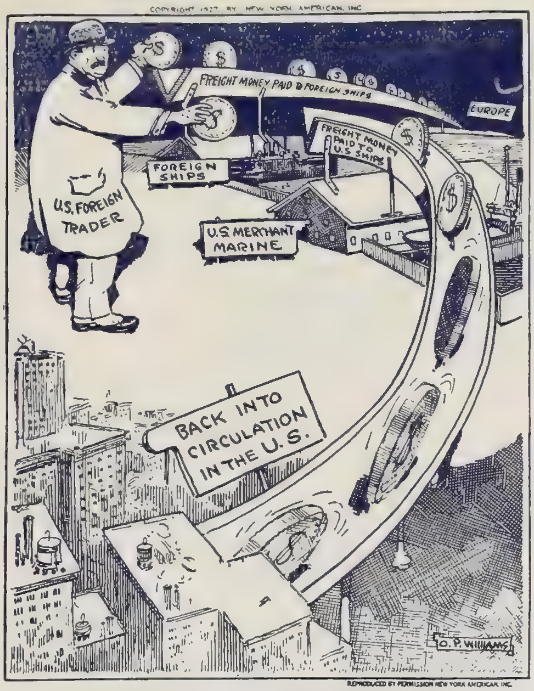
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EUROPE
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BACK INTO CIRCULATION IN THE U.S.
O. P. WILLIAMS

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THE AMERICAN DOLLAR SPENT ON OCEAN FREIGHT WILL LAND EITHER ABROAD OR HERE AT HOME. IF IT LANDS ABROAD, IT WILL BENEFIT OUR COMPETITORS IF IT GOES INTO THE UPBUILDING OF AN AMERICAN MERCHANT MARINE, IT WILL CIRCULATE AT HOME, BUILDING BUSINESS FOR EVERYBODY. EVEN IN BUSINESS WE NEED MORE LOYALTY TO AMERICA.

MANY questions are asked from time to time why this country, with its tremendous volume of foreign commerce, does not show a greater proportion of carriage in vessels of the United States. Well, the answer may differ in detail, depending upon the viewpoint of the one who undertakes to solve the problem; but there is no denying the fundamental fact that the reason is largely due to the manufacturers and shippers in this country not making the problem one of their own but being content to await the action of someone else to change the situation. Americans, be they private citizens operating their own tonnage or acting as agencies to operate Government-owned vessels, cannot force shipments into American bottoms. They can merely solicit the freight and urge the patronage for vessels flying the Stars and Stripes. They cannot bear the full burden of meeting the foreign competition that has been built up through years by those nations that have come to look upon the American carrying trade as much a part of their country's domestic affair as though it were a form of taxation or local administration.

When we consider that none of the modern greyhounds of the ocean could operate except by carrying the commerce to and from the United States, it should cause us to swell with pride in realization of the part this country plays in keeping the vehicles of commerce filled. Yet how little thought do we give to the tremendous amount of freight money that goes out of the pockets of Americans and into the coffers of foreigners through these transactions; and even less attention is paid to the injury that could be caused to our industries and be reflected to labor and all walks of life in this country, by conditions arising that would cause this tonnage, upon which we depend to keep the machinery of our industrial plants and the man-power of our farms going at full speed, to be withdrawn for emergency use in other ways. Little heed do we give to the fact that for every ton of freight we ship in foreign vessels we are sending American dollars abroad; that every dollar we send abroad in this way makes our foreign competitors stronger and helps them seek to gain our markets; that on the contrary every dollar kept at home by shipping in American vessels helps industry, helps the shipowners build more ships, provides work for shipyards, and some of the money thus spent even finds its way back to the farms. There is hardly an industry of the nation that does not share a portion of the expenditure made in the building and the outfitting and equipment of a vessel.

Foreign manufacturers realize this. They ship and sail in ships of their own nation because they know the success of their merchant marines will be reflected in their industrial lines; that their facilities for shipping will constantly increase and that in return for their patronage their ships will fight with them for foreign markets.

True it is that to some markets at present Americans can obtain better terms of shipment on foreign than upon American vessels, and where the market would be lost otherwise this must go on, but foreign ships seek to frighten American shippers into sending all their cargo on the fear that rates generally may go up. What the shippers should do is to give the American ship every possible preference consistent with holding the trade. This will gradually come back to the American exporter in benefits as American shipping grows in strength. The more American ships the more American competition.

It may be all right to talk about ample tonnage being always available under foreign flags to care for our export trade, but do we as a nation wish to let the other fellow hold the key to our continued prosperity when we can if we all work together and put just about half the patriotic spirit in our shipping that our foreign competitors do in the success of their own, be independent in this respect? Would a great organization like the Standard Oil Company depend upon a competitor to make its deliveries, knowing that the competitor could at any time regulate the delivery rates so as to cause the loss of a market, or withdraw its tank cars, wagons, or tank steamers for other uses if and when it so desired? To ask that question is to answer it. Yet that is what the shippers and exporters of this country are doing right along. We do not advocate a monopoly of the ocean, but merely urge support of our own ships to a point where they may feel American producers of goods shipped abroad appreciate and support American enterprise in shipping.

As someone aptly said, if you spend a dollar abroad for services or merchandise, the foreign country has the dollar and the United States has the merchandise; if you purchase the same service or merchandise at home, the United States has both the dollar and the merchandise or service.

Ship in American ships and keep your dollars at home.

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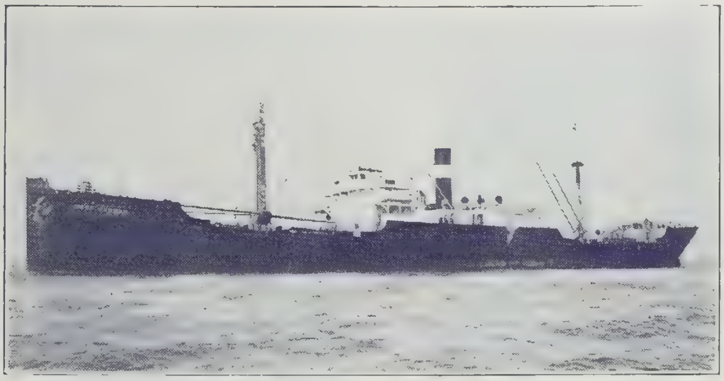

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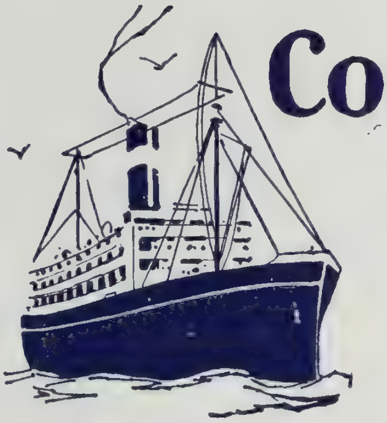

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†M.S. City of Panama...	....	June 14
S.S Venezuela	June 25	July 5
S S. Ecuador	July 16	July 26
†S.S. Corinto..........	....	July 28

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Inland Waterway Development

(Continued from Page 257.)

tonnage of iron ore mined in Minnesota downstream from St. Paul to St. Louis. The estimated carrying capacity of the fleet recommended for this service was, for an average season of open navigation, 180,000 tons each way, a service necessitating the constant employment of some 500 freight cars.

Expansion Under U. S. Railroad Administration.

Coincident with the activities under the Council of National Defense, as above enumerated, impelling economic factors, with which all are familiar, made necessary the consolidation under the Federal Government of the rail traffic systems of the nation, resulting in the creation of a transportation body in the form of the United States Railroad Administration. In the operations under the powers granted to it, the Council of National Defense was restricted to the submission of recommendations, whereas the Director-General of Railroads was vested with broad powers in the matter of creating and coordinating transportation agencies during the emergency. It was, therefore, quite logical that the waterways committee of the Council of National Defense should become merged with and increase the scope of its activities under the Railroad Administration.

Committee on Inland Waterways.

On February 15, 1918, the Committee on Inland Water Transportation of the Council of National Defense was accordingly dissolved and turned its records over to the Committee on Inland Waterways, which was established within the Railroad Administration by the Director-General of Railroads.

This committee made a very exhaustive study of the waterway situation and submitted a very comprehensive report. The first and immediate result of the report was the authorization for the construction of ten wooden barges for operation on the Chesapeake and Ohio Canal, between Washington, D. C., and Cumberland, Maryland, also the authorization for the allotment of $150,000 for dredging the Illinois and Michigan Canal. Both of these projects, especially the latter, resulted in a material increase in the tonnage moved on the respective waterways.

Next, a careful investigation was made of the situation on the New York State Barge Canal, the Mississippi River and the Warrior River. Alternative policies under which these important routes might be enabled to render the most effective war-time service were presented as follows:

(a) Immediate acquisition of existing equipment, construction of necessary additions, and direct operation in conjunction with the railway and highway systems of the country—integrating the three as one system.

(b) Cooperation with private operators by subsidies, by acquisition, construction, and charter of boats for private operation, and by assurance of freight for transport at remunerative rates.

In line with alternative (a), the committee recommended the appropriation of $17,000,000 for acquiring such desirable existing equipment as was available and for building certain new equipment for the three projects.

Acting on these recommendations, the Director-General on April 22, 1918, created the New York Canal Section, and on July 11, 1918, created the Mississippi-Warrior Service for operations on the Mississippi and Warrior Rivers.

Division of Inland Waterways.

Toward the end of August, 1918, it became apparent that a more formal organization was necessary and the Committee on Inland Waterways was dissolved and a Division of Inland Waterways created with Mr. G. A. Tomlinson as Director. This division began to function September 5, 1918.

Under the administration of the Division of Inland Waterways, the following equipment was constructed.

For use on the New York Barge Canal—51 steel cargo barges and 20 steel self-propelled barges.

For use on the lower Mississippi River—40 steel cargo barges, 6 steel tow boats and 1 steel terminal barge.

For use on the Warrior River system—20 wooden coal barges, 4 steel self-propelled barges and 3 steel tow boats.

Continuation under the War Department.

Upon the enactment of the Transportation Act of 1920, providing for the termination of Federal control of transportation systems through the United States Railroad Administration, the situation presented by the operations of the Division of Inland Waterways was recognized as being anomalous.

The accomplishments of this division, as well as those of its predecessors, had resulted primarily from the urgent necessity for relieving war-time rail transportation congestion. It was, nevertheless, recognized that a similar, if less acute, situation with regard to domestic transportation facilities would be a constant element of commercial traffic for years to come.

The general disuse into which waterway traffic had fallen during the past century had, moreover, come to be a matter of genuine economic concern. Waterway transportation, despite its many physical handicaps, was appreciated as potentially a vital factor in our national transportation system.

The Federal Government, through the Division of Inland Waterways, had for the first time in its history undertaken a thorough and practical experiment in the purely operating phase of waterway transportation. It had, however, barely more than initiated this undertaking and had in no sense carried the experiment to a logical conclusion. The results which had been accomplished prior to March 1, 1920, possessed in themselves little of real benefit for the future of inland waterway traffic. Taken as the first state of a completed project, however, they seemed to promise much of constructive importance to commerce generally.

These going water transportation organizations, with their plants, either in operation or under construction, were exclusively the property of the Federal Government without, like the railroads, prior owners to whom they could be returned. The only possible solution under the circumstances was, therefore, either to dispose of them to private owners or to continue these several operations to a logical conclusion under the Government. Under the authority in the Transportation Act, the War Department took over the properties and definitely engaged in the inland waterway transportation business as a common carrier.

Results of War Department Operation.

The Inland and Coastwise Waterways Service was operated under the direction of the Secretary of War from March 1, 1920, to June 3, 1924. In 1921 the equipment on the New State Barge Canal was sold to the New York Canal and Great Lake Corporation, and from that date the service consisted of operating the Government equipment on the Mississippi and Warrior Rivers.

The conclusions reached by the War Department after three years of experience with this service were:

1. The utilization of our great streams by common carriers is the only fair means of distributing the benefits of cheap water transportation to the very people who have been taxed to create navigable streams and canals.
2. The rehabilitation of common carriers upon our navigable interior waterways can only be accomplished by governmental pioneering.
3. There were various handicaps to the restoration of water transportation in full vigor, by governmental operation, that delayed, restricted, and hampered the accomplishment of the object sought, and such handicaps were avoidable.

Based upon these conclusions, several bills were introduced into Congress and referred to the War Department, which caused Congress to be fully informed upon the following points:

- (a) The inherent difficulties of governmental operation.
- (b) The necessity of governmental operation as a pioneer demonstrator.
- (c) The necessity of Congress providing some means which will allow the Secretary of War its mandatory to do the things he would ordinarily do as the head of a great private transportation agency.
- (d) The necessity of providing the Secretary of War with sufficient capital to overcome the conditions which militate against the success of the governmental demonstration.

The most serious and earnest consideration of these problems was given by Congress and resulted in the enactment of Public Law 185, creating an Inland Waterways Corporation with a capital of $5,000,000 for the purpose of carrying on the operations of the Government-owned inland canal and coastwise waterways system to the point where the system can be transferred to private operation to the best advantage of the Government.

Inland Waterways Corporation.

From June 3, 1924, up to the present time, the Inland Waterways Corporation has been vigorously operating the properties with a determination to prove that inland waterway transportation is a commercial success from a private standpoint. Such success as has been achieved has been largely due to the able administration of the chief executive of the corporation—Brig.-General Thos. Q. Ashburn. In recognition of his splendid management the last Congress promoted General Ashburn to become a Major-General.

The principles which the Inland Waterways Corporation has set itself out to decide are:

1. Is it possible for joint rail and water carriers cooperating to furnish cheaper transportation than all rail with a division of earnings affording each a living revenue?
2. Does the inauguration of water transportation on rivers and canals offer sufficient inducement for private enterprise to undertake it?

In working out these problems, the Government speedily recognized that there were three methods of utilizing our navigable streams; by private carriers, contract carriers and common carriers. Of these methods the obvious one for the Government to pursue was that of common carrier, because it is a fundamental principle of Government operation that it must be for the greatest good for the greatest number. Here was presented a formidable problem for, as General Ashburn has repeatedly pointed out, when considering private, contract and common carriers, it must be borne in mind that the cheapness of operation of these various carriers is in the order named, but their importance to the public is in the reverse order. If a common carrier by water fulfills its highest function of serving all the people, it must have a large overhead, and this overhead is fixed by its activities, not by the size of its fleet.

Most of the earlier experiments in inland waterway transportation failed because they did not meet all the requirements for a great common carrier.

Conditions Precedent to Success For a Common Carrier In Inland Waterway Transportation

A common carrier to be of national importance and the greatest possible benefit to the public and also to be a commercial success requires:

1. A suitable navigable waterway.
2. Proper equipment.
3. Adequate terminals.
4. Balanced freight.
5. Interchange with other carriers.
6. Equitable division of revenue.

The Inland Waterways Corporation has met all these requirements. The Mississippi and Warrior Rivers are suitable waterways; the Government has spent millions of dollars to make them such. With regard to equipment, the Corporation has developed types of barges and tow boats that are highly successful and models for operation elsewhere. Splendid terminals have been designed and constructed which give ample facilities at all stages of water and afford complete and satisfactory interchange with rail carriers. Through its aggressive traffic department the corporation has developed ample cargoes in both directions. Concerning interchange with other carriers, the corporation now has on file with the Interstate Commerce Commission joint tariffs with 165 railroads and more are being continually added to the list. With respect to an equitable division of revenue with other carriers, the corporation has waged a tremendous battle before the Interstate Commerce Commission and has finally established principles and precedents which give it adequate divisions of revenue with railroads which endeavored to throttle it by this means where all other attacks had failed. All of these activities of the Inland Waterway Corporation have blazed the way for successful inland waterway transportation and have established standards for others to follow.

Results of Operation

As a result of this scientific development of methods, the Inland Waterways Corporation has been signally successful as disclosed by the following tabulation:

Year	Tonnage	Total Revenue	Net Operating Result
1923	979,772	$2,841,699.01	$955,359.91 Loss
1924	1,071,848	3,503,751.59	532,616.42 "
1925	1,145,018	4,004,578.25	34,519.39 "
1926	1,341,578	5,179,274.74	219,511.96 Profit

In connection with the above statement attention should be called to the fact that in addition to the profit or loss shown there has been written off depreciation charges amounting to $1,492,729.53.

The above statement of operating results discloses very clearly that the Inland Waterways Corporation is a tremendous factor in the transportation of the territory adjacent to the Mississippi and Warrior Rivers. On the Warrior River in Alabama in 1925 (the latest figures available) a total of 231,464 tons was transported, of which the main items were as follows: steel and iron products 70,166 tons, manganese ore 37,942 tons, coal 26,463 tons, sulphur 21,806 tons and sugar 21,167 tons. On the Mississippi River, operating between St. Louis and New Orleans, during the same period, 1925, there was transported 913,554 tons, the principal items being grain, 215,978 tons, sugar 192,574 tons, and bauxite ore 152,493 tons.

With such a record, it would be natural to suppose that other communities would desire to participate in the benefits of cheaper transportation. This proves to be the case, for many sections of the United States are making appeals for the extension of the Inland Waterways Corporation to their rivers. As a result of this agitation, one extension is planned for this year. By June first the New Orleans-St. Louis service will be extended to St. Paul and Minneapolis. The business men of these two and other Northwestern cities have appropriated $600,000 toward the development of this Mississippi Barge project; the United States Government has appropriated an additional $1,122,000 for this extension and $1,200,000 has been appropriated for terminals by the cities of St. Paul, Minneapolis, and Winona, Minnesota, and Dubuque, Iowa.

In conclusion, it is interesting to note the following statement issued by the Corporation, February 12, 1927:

"In 1926 the operations of this Corporation saved the shippers of the United States approximately one and a half million dollars in freight rates, and through its cheap water rates on grain for export set the price, according to records of the St. Louis Merchants Exchange, so that the farmer received for his grain nearly 3 cents a bushel more than he would have otherwise received. This annual price of 3 cents per bushel was not alone confined to the grain shipped by the facilities of the barge line, but according to the statements of great grain dealers themselves, set the price at which the hundreds of millions of bushels exported was purchased from the farmer. Assuming that these statements of great grain dealers are correct, then this service on grain alone gave to the farmer in actual cash in 1926 50 per cent of the entire going value of the Inland Waterways Corporation, or in the neighborhood of seven million dollars.

The benefit was extended directly to the farmer whose grain was exported, and indirectly to the farmer whose grain was sold for domestic purposes. Plans are under consideration, and advancing toward culmination, whereby the Corporation may become, what it is not now, a factor in the domestic distribution of grain and other agricultural products which will largely increase its value to the agricultural communities of the north, northwest and south, and to the consumer generally.

Thousands and thousands of dollars were saved to the consumer on sugar shipped upstream, and distributed through 217 cities.

The price of every article of aluminum manufactured in the midwest, and sold throughout the United States was fixed by the reduced rate at which bauxite ore was carried upstream by the barge line to St. Louis.

The cheaper rates on the carriage of cotton offered a market at a lower price to the exporter, with a consequent ability on his part to buy at a higher price, even though the world's market was glutted.

Cheap rates on manganese ore, sulphur, etc., enabled vast quantities of steel to be manufactured cheaper, and by competition based on transportation enabled the consumer to get his building materials cheaper.

Vast quantities of coal transported cheaply by water reduced the cost of the manufacture of power, gas and heat.

In addition to these examples, hundreds of others might be cited, but the outstanding achievement of this corporation has been the demonstration that coordinated rail and water transportation can furnish cheaper transportation to the whole country, and that both participating carriers, rail and water, will receive a remunerative revenue therefrom.

This corporation, by its business-like methods of administration and operation under the guidance of the Secretary of War, has demonstrated to private capital that it may safely invest in rejuvenating water transportation on our inland streams and canals, and by its very successful demonstration has united public opinion on the value and the necessity of further waterway development.

The engineers of the army have built and are building and maintaining navigable waterways, and the Inland Waterways Corporation, another activity directly controlled by the Secretary of War, is successfully operating upon 2500 miles of river, despite the fact that it has been so widely proclaimed that "the days of waterways have passed, never to return."

The harnessing of waterways and railways in one team has been successfully tried out, and never again can there be cut-throat competition between them.

The people of the United States may confidently look forward to days not far distant, when every navigable stream in the United States will again, in cooperation with the railroads, be furnishing effective and cheaper transportation without the expenditure of vast sums to furnish new arteries."

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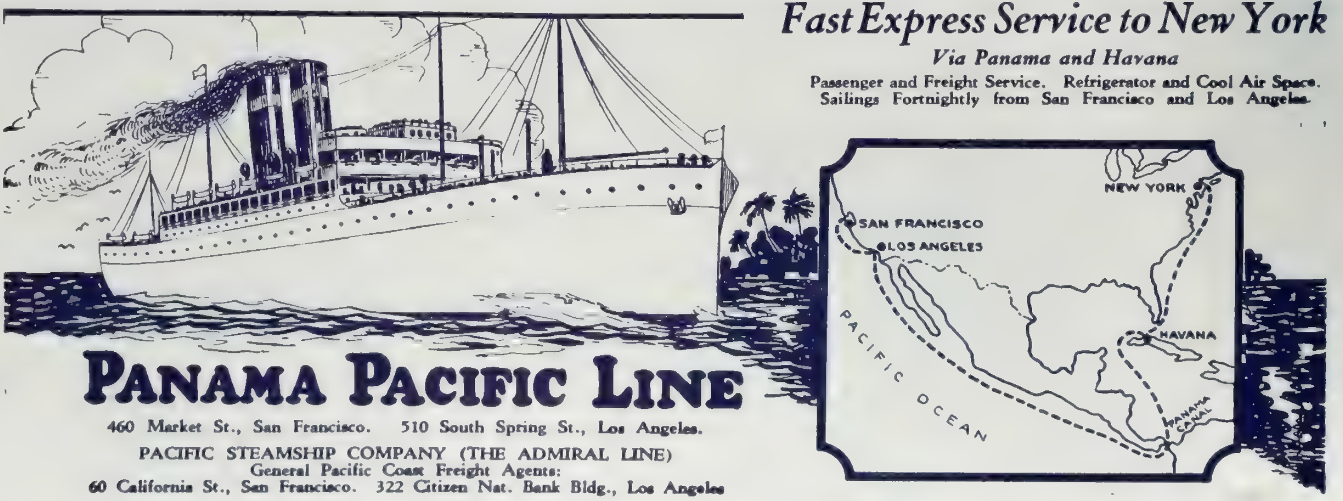

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Who's Who afloat and ashore

Edited by Jerry Scanlon

When the Los Angeles Steamship Company's new liner City of Honolulu sails on her maiden voyage on the fourth of this month, the engine rooms of the vessel will be in charge of three men qualified to hold the office of chief engineer.

The engine room staff is headed by C. C. Bentley, who was head of the engine room of the City of Los Angeles since August 1922. During the installation of the new machinery in the City of Honolulu, Bentley was supervising officer.

H. E. McEwing, formerly chief engineer on vessels of the McCormick Steamship Line, will be second assistant on the City of Honolulu. During the war he served on transports as chief engineer.

Chief Bentley's second assistant engineer is W. E. Lockhart, who was second engineer on the City of Honolulu when the vessel operated out of Atlantic ports under the name of the President Arthur. Lockhart accompanied the City of Honolulu from New York to Los Angeles and assisted in what is conceded to be the largest passenger accommodation job ever performed on the Pacific Coast.

Engineering staff of steamship City of Honolulu: Left to right: H. E. McEwing, first assistant; center, C. C. Bentley, chief engineer; right, W. E. Lockhart, second assistant.

There were several shifts in the engineer's personnel of the Panama Mail Steamship Company during the past month. Merle Johnson, who had been shoreside, returned to sea duty as chief engineer of the steamer Ecuador. He relieved E. Grant Rowley. Chief Rowley is now chief engineer of the liner Corinto.

William Sykes, chief engineer of the Panama Mail liner Colombia, now on shore leave.

Charles Kuhn of the Corinto was shifted to the Panama Mail liner Colombia, relieving Chief Engineer William Sykes. Chief Sykes is off for one voyage. He was presented with an eight-pound baby girl by Mrs. Sykes, while he was aboard the Colombia en route to San Francisco from New York.

Under the direction of Chief Engineer Sykes, the engine room force of the Colombia landed a fifteen-foot man-eating shark off Champerico on the last trip.

E. C. Earl, assistant harbor engineer for Los Angeles, has completed a survey of New Orleans harbor and other Gulf ports, and he will submit his observations to the harbor board.

Earl's inspection tour was for the purpose of gaining first hand data on Gulf port arrangements, with a view of utilizing some of these methods at Los Angeles harbor in the handling of cotton and fruit shipments.

Word comes from New York that will be of interest to many Pacific Coast shipmasters that Captain Frank E. Beadnell, R.N.R., commander of the I.M.M. liner Adriatic, will retire from the sea.

The veteran skipper is eligible for retirement, and he stated that he plans to built himself a home on the Isle of Man, where, as a country gentleman, he can still keep an eye on the sea he loves so well.

A signal honor was paid Enrico Moreilli, head of the Italian passenger department of the International Mercantile Marine in New York recently, when, at a dinner in the Pennsylvania Hotel, he was decorated with the cross of the Chevalier of the Crown of Italy.

The presentation was made at a dinner dance in honor of Mr. Moreilli by his fellow associates, and the bestowal was made in the name of the king of Italy. The signal honor was for Mr. Moreilli's humanitarian work among the Italians during and following the World War.

From the New York offices of the Panama Pacific Line comes a note of interest. The message stated that Mrs. Thomas H. Ince, widow of the famed movie producer, had arrived at Naples aboard the I.M.M. liner Adriatic, and within an hour was "cruising" over the Italian city in her own automobile, which had been shipped from Los Angeles aboard the liner Manchuria to New York, and there transshipped to the Adriatic.

The automobile was transported

Charles Kuhn, acting chief engineer of the Panama Mail steamship Colombia.

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a total distance of 10,000 miles—believed to be a record for ocean shipment of an auto, according to officials of the company.

Aboard the Dollar liner President Garfield the following appointments were made by Chief Engineer William D. Schoningh, while the vessel was in port at San Francisco: Daniel A. Beaton, first assistant; Olaf Mitskog, second assistant; Frank W. Krause, third assistant; and Everett A. Smith, fourth assistant.

In the various reassignments of the Matson Navigation Company's engineering fleet due to selecting the personnel of the new liner Malolo, which goes into service next month, out of San Francisco to Hawaii, Vance L. Mills, formerly second assistant on the freighter Manoa, was appointed first assistant of the Manulani.

Walter G. Clayton has been appointed chief engineer on the Point Sur, succeeding George W. Alberts, who was ordered east to assume charge of the engine room on a vessel that the Swayne & Hoyt interests recently purchased.

After a two weeks' fishing trip in the Feather River country, California, James Dunne has again donned the dungarees as second assistant engineer aboard the freighter Griffdu.

Hawaiian hotel and tourist officials predict that 300,000 visitors will come to Hawaii this year aboard vessels out of Pacific Coast ports, according to a report brought back from the Islands by Herbert N. Thomas, general passenger traffic manager of the Matson-Oceanic Line, who spent three weeks in Hawaii.

Takeo Yamamoto, San Francisco manager for the Nippon Yusen Kaisha, announces the appointment of William L. Looyick, as freight and passenger agent at San Francisco. Mr. Looyick assumes his new duties the first of June.

R. C. Dwyer, formerly assistant chief engineer of the United States Line's flagship Leviathan, has been selected as the chief engineer of the new Matson liner Malolo, according to an announcement just made by William P. Roth, vice-president and general manager.

H. T. Keene, formerly chief engineer on the freighter Manukai, has been appointed first assistant engineer.

Commodore Peter Johnson, dean of Matson Line skippers, will command the Malolo when she sails from New York this month for San Francisco, to enter the Hawaiian service. His second in command as executive officer will be Captain Charles A. Berndtson.

Commodore Johnson was formerly master of the Maui, and Captain Berndtson was master of Wilhelmina. Captain Berndtson joined the Matson Line in 1916 as quartermaster.

H. W. D. McKenzie, who joined the Matson services in 1916 as freight clerk, has been selected as purser of the Malolo.

M. J. Wright, recently appointed Pacific Coast manager of the Luckenbach Steamship Company

San Francisco transportation executives were grieved to learn of the death of A. E. Difney, joint manager of the Panama Pacific Line in Chicago on May 2. Mr. Difney was well-known in both steamship and railroad travel circles both on the Atlantic and Pacific Coasts.

Determined to make the Point Lobos lookout station, controlled by the Marine Dept. of the San Francisco Chamber of Commerce, second to none in the world in efficiency and latest equipment for the reporting of vessels and weather conditions, plans have been formulated to equip the lookout station with a powerful radio, it was announced by Frank O'Connor, vice-chairman of the marine committee. Mr. O'Connor is manager of the Donovan Lumber Company and is one of the most ardent workers for the development of San Francisco's maritime commerce.

Takeo Yamamoto, San Francisco manager of the Nippon Yusen Kaisha, in a review of the company's business last month, which marked the first anniversary of the company since its consolidation with the T. K. K., stated that the steamship line had enjoyed the best year since the war, and showed a healthy increase over any year that the Toyo Kisen Kaisha operated the service. Salient facts in the company's business outlined by Mr. Yamamoto was the statement that the N.Y.K. vessels had brought into the United States a total of 75,284 tons of cargo, which included shipments of silk valued at $85,000,000. Outward cargo on the company's transpacific liners aggregated 80,000 tons, during the last year. He also pointed out that the work of construction of three new motor driven vessels for the California service had been started and that the company had opened an office in Chicago.

There will be no changes in the deck officers or engine room forces aboard the three steam schooners, the Frank D. Stout, Brookings, and Necanicum, which were purchased by Andrew F. Mahony last month from the California & Oregon Lumber Company. The Mahony fleet now aggregates nine coastwise lumber carriers.

Dissolution of Meyer, Wilson & Company, one of the oldest shipping concerns on California Street, was consummated last month. Two new firms will emerge from the old one, H. L. E. Meyer, Jr., & Co., and Wilson & George Meyer and Co. Meyer, Wilson & Company were pioneers in the European-Pacific trade.

With the acceptance of the resignation of H. C. Cantelow, following the arrival in San Francisco of Lewis Luckenbach, vice-president of the Luckenbach Steamship Company, M. J. Wright, who joined the company in October 1922, as district manager in Seattle, on June 1, assumed the position left vacant by Mr. Cantelow with the title of Pacific Coast manager.

Mr. Wright came to San Francisco May 1926, and assumed his duties as freight traffic manager. He is one of the best known steamship officials on the Pacific Coast.

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In 1905, Mr. Wright joined the old Pacific Coast Steamship Company. He remained with the company when it merged in 1916 with the Pacific-Alaska Steamship Company and assumed the new name of the Pacific Steamship Company. For two years Mr. Wright served in Manila as manager for the Admiral-Oriental service. When he joined the Luckenbach forces he was freight traffic manager under A. F. Haines in the Pacific Steamship Company's Seattle offices.

Zac T. George was named by Mr. Luckenbach as Pacific Coast traffic manager.

J. L. Burnside, Puget Sound manager for the Williams Line, is back on the job at Seattle, after a visit to New York in connection with company business.

Claude Daly, genial member of the firm of J. J. Moore & Co., who has been attached to the Seattle office for sometime, is again in San Francisco, attached to the home offices. His place in Seattle was taken by W. S. Barr, while the Portland offices will be under direction of R. M. Stenger, who was assigned to the Oregon headquarters from the Seattle offices.

The performance of the four-masted British bark Garthpool in logging 14 knots and daily runs of 300 miles on the voyage from the Mersey to Australia, should thrill the hearts of the "Rocking Chair" fleet on the floor of the Exchange as well as old-time clipper ship masters throughout the world.

The report of the fast performance of the British sailer was received in advices from the Antipodes. The Garthpool is reported to be loading grain for the homeward trip around Cape Horn.

In the re-adjustment of important executive positions on the Luchenback piers ordered by Lewis Luckenbach, son of Edgar F. Luckenbach, Edward Ramey, chief engineer aboard the freighter Andrea Luckenbach, has been ordered to San Francisco to assume the position of port engineer. He will assume his new duties on June 15, with the arrival of the vessel.

The position of port captain was abolished. Other appointments made on the Luchenback piers were: W. G. Perow, appointed superintendent of piers to succeed George Davidson, resigned.

Paul Chandler, district manager at Seattle, resigned and was succeeded by J. G. Euson, formerly attached to the Portland office. T. G. Maddox, assistant general freight agent at Los Angeles is now district manager at Portland, While W. L. Robertson, pier superintendent at San Pedro, is functioning as terminal superintendent at the southern port.

The general offices of the Alaska Packers' Association at San Francisco received the sad news of the death of Captain Frederick Stindt in Alitak, Alaska, on May 9. The news was received with regret among Alaska sailing ship masters and many old sea captains are now in "Snug Harbor" who sailed with Captain Stindt in the heydays of the sailers.

Captain Stindt has been for many years superintendent for the Alaska Packers in Alaska. He was master of the fast barkentine Centennial. He is survived by his widow and two children, who reside in Alameda.

Appointment by Ralph J. Chandler, general manager of the Los Angeles Steamship Company, of Captain Arthur Self as master of the newly completed liner City of Honolulu was well received in Pacific shipping circles. Captain Self has met thousands of people during his career as master of the company's coastwise liner Yale. First Officer Frank Johnson of the Yale was named successor to Commander Self.

The first of June, the title of vice-president will appear after the name of J. Caldwell Jenkins of the Merchant Fleet Corporation, and the same title has also been conferred on E. A. Kelly. Jenkins has been director of industrial relations for the shipping board and Kelly has been director of operations for the fleet corporation. Under the reorganization plans of President Dalton, Jenkins was given the title of vice-president for administration and Kelly became vice-president for operations. Both appointments were approved by the Shipping Board.

Following the death of Mr. Henry Dearborn in Seattle last April, Roger D. Lapham, president of the American-Hawaiian Steamship Company, announced the following changes and appointments:

C. D. Kennedy, agent at Portland for many years, has been vested with the title of northwestern manager with supervision over all the company's affairs in that territory. H A. Shook's appointment to fill the vacancy caused by the death of Mr. Dearborn.

F. N. Mills, who was attached to the San Francisco offices for a number of years, was ordered to Portland to fill the office of Mr. Kennedy. Mills' place as claims agent in San Francisco was assumed by W. E. Johnson, formerly pier agent at San Francisco, and his position was undertaken by J. E. Prince.

All those appointed have been with the American-Hawaiian since 1920.

Charles L. Wheeler, vice-president and general manager of the McCormick Steamship Company, reported that it felt good to be back in San Francisco after three months' absence in Eastern seaboard points and Washington.

During Mr. Wheeler's visit to Washington he closed a deal for the purchase of two more vessels from the Shipping Board, and while no report emanated from the McCormick offices, it was stated that negotiations are nearing completion for the purchase of four more ships.

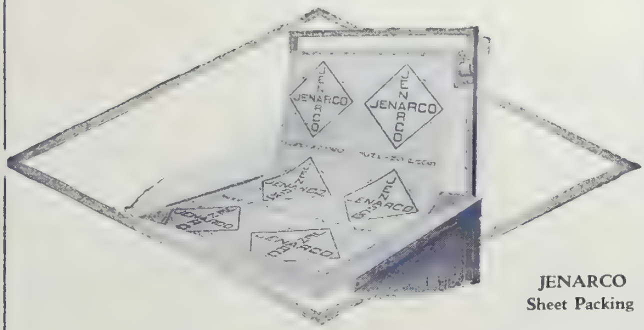
Shipping men and engineers have been visiting the Hanlon Shipbuilding & Drydock Co's. plant at Oakland to inspect the tank ship Maltha, which was launched last month for the Union Oil Company.

The Maltha has been designed especially for carrying asphalt in liquid condition. In order to prevent the material from solidifying while in transit the vessel has been constructed with double hulls and steam pipes between the two. This, according to the engineers, guarantees the maintenance of a stable temperature.

A. O. Pegg, supervising engineer for the Union Oil Company, stated that he was highly pleased with the Maltha.

To handle the increased business that will accrue with the placing in service of the new liner Malolo, the Matson Navigation Company announced the appointment of Waldemar L. Heathcote as passenger representative at Los Angeles.

Mr. Heathcote assumed his duties June 1. He was formerly with the Raymond & Whitcomb tours and is widely known in steamship and railroad passenger circles.



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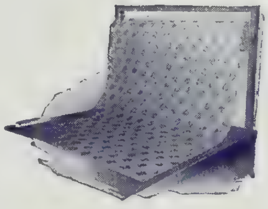

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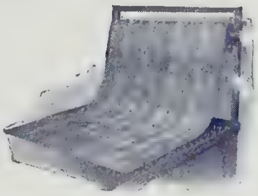

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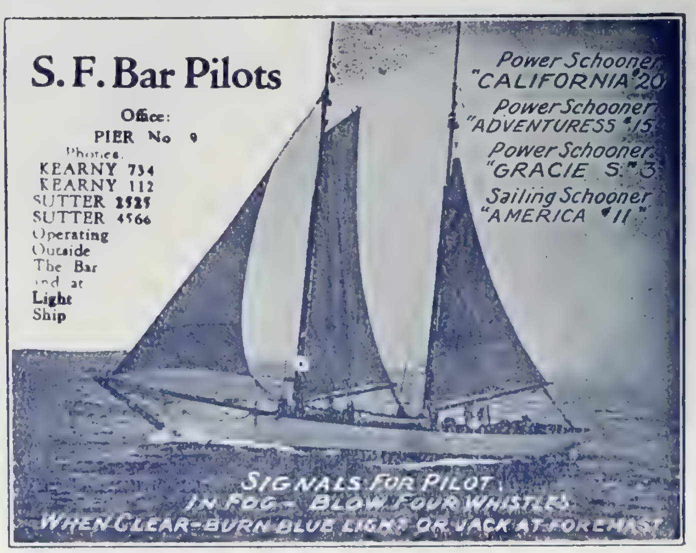

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Wave of Foreign Combinations

(Continued from Page 259.)

tion standpoint. Therefore, we have national and international combinations abroad covering practically every commodity used in industry or trade. Soap, wall-paper, cotton, yarn, meats, Portland cement, chemicals, artificial silk, explosives, banking, electric lamps, linoleum, iron, steel, velveteen, glue and so on, through a list of innumerable items. Germany has 2000 active cartels, England is doing her best to combine the weak with the strong and produce shock troops of great vigor; while France, Belgium, Italy, and other countries are determined not to be left among the group of camp-followers.

In pre-war days there were many European cartels and combines which served to balance the powerful efforts of our great individual corporations. Faced with the need of paying large war debts, of recovering lost trade territory, of providing for protection in the home market, of putting into action those technical advantages which we possess and which we are exporting continually in the form of machinery and practice, continental and international traders are determined as never before to utilize the combine, cartel, comptoir, amalgamation, or whatever it may be, to make them stronger and more efficient throughout the world.

Our Interest in International Combines

It is true we have not been idle and indirectly and directly we have become participants in international combines. Our interest in these combines is partly voluntary, partly involuntary. It may take the form of participation in foreign organizations working outside of the borders of the United States, or in those active within our own country. Voluntary participation may be purchase of an interest in a foreign group by our banking, industrial, or commercial interests, it may be agreement for limitation of territory, price-fixing, and so on, or it may be purchase of interest in subsidiaries of foreign combines established in this country. Involuntary participation takes the form chiefly of investment by our public in foreign industrial and commercial enterprises, and as time goes on this interest will have weight in control. The importance of foreign holdings in Northern Pacific some 25 years ago is still fresh in the memories of many of us. Furthermore, many of our great corporations have world-wide organizations that frequently dominate branches of trade and are powerful rivals of European cartels or combines.

We participate in the international combines covering rayon, explosives, and paints. We have our part in international understandings covering manganese. The German dye trust has American connections, we are interested in the international dynamite trust, while the Swedish match trust has been financed in this country and its activities are directed from this part of the world. In aluminum, copper, packing products, zinc, electric lamps, petroleum products, and many other combines we are part and a very important part of international understandings.

"Not Monopoly, But Reasonable Freedom and Fairness."

This paper is not a defense of trade monopoly. It is not an effort to procure the complete absence of government concern for the people in matters of this sort, but there can be no doubt that the trend of the times is definitely in favor of obtaining such benefits as may be possible from wise and reasonable cooperation in industry and commerce, and the recognition on the part of the government of the need of such a thing. This paper is particularly for the purpose of calling attention to trends throughout the world which must be considered in any international trade activity, for the movement toward mergers, amalgamations, grouping of interests in this or that form is obtaining momentum bound to be an increasingly important factor in international trade activity, and one that the business men of this country will be called upon to consider in their plans, prices, and sales effort.

Our Export Trade Act, it is true, grants exemption from anti-trust laws to the association solely engaged in export trade, but provides that there must be no restraint of trade within the United States or restraint of the export activity of any domestic competitor. It further provides that any agreement or understanding which enhances or depresses prices or substantially lessens competition within the United States or otherwise restrains trade therein is absolutely prohibited. All of this means that our freedom from restraint even in export trade is only partial.

The time has arrived for the business interests of the United States to demand not alone that the status of trade combinations be clarified, but that our laws be so amended that reasonable freedom and fair play be accorded us in our commercial activities. We have made a fetish of free competition without defining of what this consists, and, indeed, without knowing.

Address made before the Fourteenth National Foreign Trade Convention, Detroit, May 27, 1927.

Federal Banks and Foreign Trades

By J. A. H. Kerr, Vice-President, Security Trust & Savings Bank, Los Angeles.

SOMETHING should be done by the banking institutions of other sections of our country to stabilize and aid in the development of our foreign commercial activities similar to the action taken by certain New York banks, if a regional distribution of the benefits of our foreign commerce is desirable.

Now in all of the discussions devoted to our subject by those engaged in foreign trade, the latter have maintained that:

Banks and financial institutions should assist in the pioneer development of foreign trade. They (banks) should not wait until foreign trade is established, as their assistance is vital in creating the trade outposts.

It also seems clear that, in a country as large as the United States, financial organization for foreign trade should be on a regional basis. The same objections which pertained to concentration of capital for farm aid and general commercial banking, apply here with equal, if not greater, force. With these fundamental ideas in mind, and granting the desirability of foreign trade development and extension, of which there would seem to be no question, it appears to me that we have had during the past ten or twelve years sufficient

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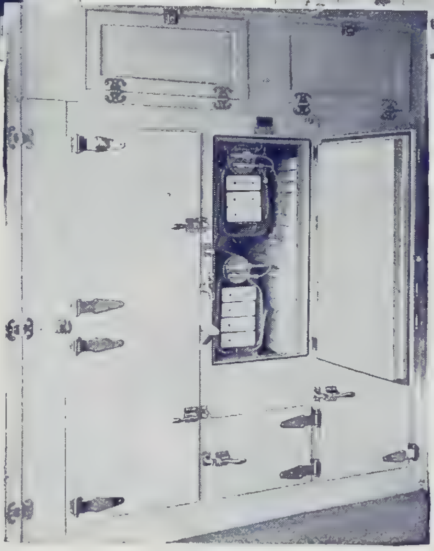

Frigidaire is particularly adaptable to the uses of yachts, large or small. These pictures show Frigidaire installation on the "North Star", used by Drs. Will and Charles Mayo of Rochester, Minnesota, for cruising on the lower Mississippi and the Gulf of Mexico.

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legal authorization placed upon the statute books of the country to provide the necessary institutions to put these ideas into effect. There is the provision in the Federal Reserve Banks. There is the provision in the same Act authorizing national banks of a certain capital structure to establish foreign branches. There is the so-called Edge Act which authorizes the organization of foreign banking corporations. Finally, there is the amendment to the Federal Reserve Act which authorizes any national bank to invest up to ten per cent of its capital and surplus in the stock of foreign banking corporations.

Without waiting for any further legislation, but using the authority already extended, I suggest, therefore, the following program for providing the necessary financial organization for the regional development and stabilization or our foreign trade activities.

That the Federal Reserve Banks establish branches at strategic points throughout the world, using for this purpose the surplus capital which they now carry unemployed. Naturally, these branches should be located in those countries in which we have invested most heavily, either in the form of government or corporate securities, or other capital investments.

In the establishment of such foreign branches of the Federal Reserve Banks, it would be highly advisable and necessary to effect, by some means of coordination, the proper distribution of such branches as between Federal Reserve districts. Again, we are confronted with the desirability of considering this phase from a regional standpoint. Without question, the proper authority to effect such coordination would be the Federal Reserve Board, which should be vested with authority to lay down general policies and to issue specific permits for the establishment of such branches.

The putting into effect of this program would have many advantages and would carry with it many possibilities, some of which are only dimly realized at the present time. It is only possible for me to suggest a few of them here.

Foreign branches of Federal Reserve Banks would serve to eliminate a great deal of overlapping in capital investments. They would eliminate the duplication in organization and personnel which occurs in the establishment of branches of competing private banks. They would give a larger operating unit and afford a better regional distribution throughout our country of the benefits of foreign commerce. The Department of Commerce maintains district offices in our most important cities, the prime purpose of which is to aid in the promotion of foreign commerce. This is a definite recognition by the government of the principle of domestic development of foreign business through regional agencies. Why should not this absolutely sound principle be extended to include the structural organization of our banking service for foreign trade? There is every reason to suppose that the same beneficial results would flow from such regional distribution of banking strength as do now from the regional division of the promotional activities of the Department of Commerce.

The plan which I suggest has nothing radical in it. It would be merely one phase of a modern tendency. The passage of the MacFadden Bill very likely presages a new epoch in the banking in this country. An epoch in which the economic value of conducting financial business through large units of a regional character will be frankly recognized. It is this last point that I desire to have stand as the paramount idea of this paper, which is that the regional development of foreign branches of Federal Reserve Banks would insure the requisite larger units necessary and would effect a proper and desired national distribution of the benefits of our foreign commerce.

Abstract of an address made before the Fourteenth National Foreign Trade Convention, Detroit, May 27, 1927.

Freights, Charters, Sales

May 18, 1927.

THE following steamers are reported fixed with grain from the North Pacific to the United Kingdom/Continent: British stmr. Ben—, 33/9, Aug., Strauss & Co.; Japanese stmr., same; Japanese stmr. Glasgow Maru, wheat and barley from San Francisco, one port, 35/3, two ports 36/6, May loading, Strauss & Co.; British stmr. Queenmoor, May/June, 31/-; a stmr., 34/3, Aug.; British stmr. Ben—, 35/-, Sept., Heatley & Co.; British m.s. Cape York, June, Canadian American Shipping Co.; British stmr. Dalblair, May/June, Balfour Guthrie & Co.; British stmr. Ben—, 35/-, Kerr Gifford & Co.; British stmr. Benarty, Aug., Strauss & Co.; British stmr. Bridgepool; barley, Aug., 35/-.

The Japanese stmr. Yomei Maru is reported fixed from British Columbia to the Orient, grain (relet) June, Canadian Cooperative Wheat Producers.

The American stmr. City of Nome is reported fixed from Grays Harbor to Australia, April 1, J. J. Moore & Co., and the British m.s. Aylnbank from Columbia River to Sydney, May/June, same charterers.

For lumber to the Orient, the following fixtures are reported: Japanese stmr., North Pacific to Japan, $11.50, May/June, Canadian Transport Co.; French stmr. Lina L. D., same, lump sum, May, Canadian American Shipping Co.; Japanese stmr., same, $11.50, May/June, Douglas Fir Exploitation & Export Co.; Japanese stmr., one port North Pacific to one port Japan, $12, Apr.; Japanese stmr., Puget Sound to Japan, May, Yamacho & Co.; Japanese stmr., Grays Harbor to Japan, $10.25, May, Yamacho & Co.; Japanese stmr. Koyu Maru, one port North Pacific to one port Japan, $10.75, May, Canadian Transport Co.; Japanese stmr. Yayoi Maru, Puget Sound and Grays Harbor to Japan, May, Nakagawa & Co.; Japanese stmr. Milan Maru, Grays Harbor to Japan, same; Japanese stmr. Woyo Maru, Grays Harbor & Columbia River to Shanghai, $10.75, May/June, Canadian Trading Co.; Japanese stmr. Boston Maru, Grays Harbor & Puget Sound to Japan.

The American stmr. James Griffin is reported fixed from North Pacific to Callao, lumber, May loading, W. R. Grace & Co., and Japanese stmr. (K. Line), North Pacific to West Coast South America, June, W. L. Comyn & Co.

The American stmrs. Albert Jeffress, Edgar Bowling, James B. Duke, George Allen, Wm. Campion, and Wm. Perkins are reported fixed from North Pacific to U. S. Atlantic ports, lumber, Krauss Brothers; American stmr. Mary D., Puget

Sound to New York and New London, U. S. Steel Products Co. and American stmr. Commercial Spirit, Grays Harbor to New York, $16, June loading.

The American tanker Swiftarrow is reported fixed with fuel oil from California to North of Hatteras, $1.01, May loading.

The following miscellaneous fixtures are reported: Norwegian stmr. Frogner, British Columbia to U.K./Continent, lumber and general merchandise, lump sum, May, Canadian American Shipping Co.; Norwegian m.s. Handicap, Puget Sound, Grays Harbor and Columbia River to U.K./Continent, lumber and general merchandise, Aug./Sept., E. E. Johnson & Co.; Norwegian stmr. Hesperos, Puget Sound, Grays Harbor and Columbia River to Rotterdam and Hamburg, lumber and general merchandise, July/Aug., same charterers; Danish stmr. Kotonia, Puget Sound to Minatitlan (Mexico) box shooks, May, Thorndyke Shipping Co.; American stmr. Star of Italy, berthed San Francisco to Buena Ventura direct, May, William Gissler; British stmr. Ben—, North Pacific to U.K./Continent, lumber and general merchandise, lump sum, June, Canadian American Shipping Co.

The following time charters are reported: Norwegian stmr. Erviken, Pacific trade, delivery April, 6 months, Canadian Transport Co.; Danish m.s. Chastine Maersk, North Pacific to Australia, delivery North Pacific, redelivery Australia, 5 months, July, $1.75, American Trading Co.; Japanese stmr. Fukko Maru, 7/9 months, delivery Japan, May, $1.50, American Trading Co.; Japanese stmr. Yonan Maru, 12 months, Pacific trade, June, Yen 1.85, Ocean Transport Co.; Norwegian m.s. Fordefjord, British Columbia to New York, May, Canadian Transport Co.; British stmr. Atlantic City, delivery British Columbia, redelivery North of Hatteras, $2.10, Canadian American Shipping Co.; Norwegian stmr. Storviken, Pacific Trade, $1.05, Canadian Transport Co.

The following steamers are reported sold: Stmr. Elizabeth, E. & E. T. Kruse to Hobbs Wall & Co.; American stmr. Absakora, U. S. Shipping Board to McCormick S. S. Co., $131,000; American stmr. Point Arena, Hartwood Lumber Co. to General Steamship Co.; American ship Star of Italy, Alaska Packers Assn. to Darling, Singer Co. of Portland; American stmrs. Lake Singara and Paria, U. S. Shipping Board to International Packing Co.; American stmrs. Necanicum, Brookings, and Frank D. Stout, California & Oregon Lumber Co. to Andrew F. Mahoney; American schr. Alice, Robinson Fisheries Co. to Moving Picture Corp.; British stmr. Harold Dollar, Dollar S.S. Line to T. L. Duff, Ltd., London.

PAGE BROTHERS, Brokers.

Merchant Fleet Organization

UNDER the recent re-organization plan of the United States Shipping Board Merchant Fleet Corporation proposed by President A. C. Dalton and approved by the Shipping Board, General Dalton will have two Vice Presidents.

J. Caldwell Jenkins has been selected to be Vice President for Administration, while E. A. Kelly, the present Director of the Operations Department of the Merchant Fleet Corporation was made Vice President for Operations. Both of the appointments were approved by the Shipping Board.

The work of the Vice President for Administration will be concerned with all the administrative and fiscal affairs of the Corporation and will have direct supervision of the executive department, the finance department, the comptroller's department, the insurance department and the secretary's office, etc.

Mr. Kelly, Vice President for Operations, will direct all physical activities of the Corporation which will include the traffic department, the operations department, the supply department, the United States Lines, etc. The entire fleet of Shipping Board vessels including active and inactive ships have been placed under the administration of the operating department reporting to the Vice President for Operations. The Ship Sales Department will report to the Vice President for Administration.

Diesel Tug

(Continued from Page 273.)

engineers is the fact that all Foos diesel engine horsepower ratings are based upon the low brake mean effective pressure of seventy pounds.

Comparing the Foos 250 horsepower diesel engine which will be installed in the 65-foot tug above discussed with a 250 horsepower, heavy weight, direct-connected diesel engine of the six-cylinder type, 11 by 15 inches, turning at 275 revolutions per minute, the result is distinctly in favor of the Foos, inasmuch as it will show 10 per cent more piston displacement and in addition possesses savings in brake mean effective pressure, together with, at the very least, 20 per cent more propeller efficiency. True comparative horse power ratings can be made only upon the basis of piston displacement and mean effective pressure, and it is in relation to this comparison that Foos diesel engines are rated.

Steamer Lewis Luckenbach, leaving harbor of Everett, Washington, with cargo of lumber.

Pacific Marine Review

The National Magazine of Shipping

July, 1927

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Pacific Marine Review, Vol. 24, No. 7. Published Monthly in San Francisco. Entered as second class matter at the post office at San Francisco under the act of March 3, 1879. $2.00 a year.

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MARINE HISTORICAL SERIES: No. 6

If Captain Kidd had Used Jeffery's

LEGEND tells us that Captain William Kidd, who, when at home, maintained his domicile at what is now the corner of Pearl and Hanover Streets, New York City, was the most notorious pirate of the gang that terrorized shipping in the latter part of the Seventeenth Century.

Recent investigations, however, tend to prove that Captain Kidd was the victim of circumstances—innocent of the crime for which he was hanged at Execution Dock, England. He was, we are now told, operating in a perfectly legitimate manner under letters of marque granted by the English government. In fact, so certain was he of his vindication that he voluntarily surrendered to the authorities at New York, when every opportunity was available to make good his escape.

According to one version his whole misfortune may be traced to the fact that an unforseen delay occasioned by the necessary recaulking of his vessel's deck seams with pitch at Madagascar enabled a bitter rival to reach New York first, spread the false news of his perfidy, and perfect the noose that welcomed his homecoming.

Had Jeffery's Marine Glue been known in those days, Captain Kidd would have experienced no difficulty on account of leaky seams, he would have arrived home ahead of his rival's coming, and he would no doubt have been received by the populace of the Colony with open arms.

Wise ship owners today are not bothered with delays of this kind. The presence of

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Our New Booklet No. 27 gives valuable information on where and how to use Jeffery's Marine Glue.

L. W. Ferdinand & Co.
152 Kneeland Street, Boston, Mass.

Pacific Marine Review

CONTENTS

July, 1927

Frontispiece ... 3

Editorials ... 301

Shipping Profits; Shipbuilding; Physical Examination for Seamen; Douglas Fir Rebuilds Constition; America's Travel Ration 303 Miles; Safety at Sea.

The Operating Differential of American Ships, by Norman F. Titus ... 303

A statement of the handicaps against American vessels engaged in foreign trade.

The Sewall Big Four, IV, by F. C. Matthews ... 306

The Roanoke, Largest Wooden Merchant Ship ever built.

Another Legislative Straw ... 307

New Coast Guard Cutter Northland ... 308

A modern steel vessel with diesel-electric propulsion takes on the Arctic work of the historic steamer Bear.

Diesel-Electric Propulsion Gains Favor, by H. C. Coleman ... 310

New Ferries Successful ... 312

Southern Pacific diesel-electric drives demonstrate reliability, flexibility, and economy in daily service.

New Diesel-Electric Tug ... 313

Ingersoll-Rand-Westinghouse propulsion machinery with pilot house control demonstrates great flexibility and efficiency in towing operation.

Malolo on Her Trials ... 314

Crack Matson Liner demonstrates her ability and seaworthiness under serious emergency.

Biography of Lewis J. Spence, Executive Officer, Southern Pacific Company ... 316

New Coastwise Liner ... 317

Federal Shipbuilding Company Building Fine Passenger and Freight Flyer for the Morgan Line Service of the Southern Pacific Company.

King and Queen of the Delta ... 320

Pacific Workboats and Their Power Plants:

With the Boat and Engine Builders ... 325
Views of Fishing Boat Del Monte ... 325
The Worthington Marine Diesel Engine ... 326
Hicks Marine Gas Engine ... 327
The Jervis Marine Gas Engine ... 340

Auxiliaries, Ship Supplies, Marine Equipment:

Micarta Airplane Propeller Blades ... 328
All Steel Induction Motors ... 328
New Gasoline Cuts Costs ... 329
Haskelite Makes a New Record ... 329
Experiences with Superheat in a Scotch Boiler Triple Expansion Freighter ... 330
Hunt-Spiller Rings Successful ... 332
Allen Bronze Screws ... 332
Guaranteed Refractory Material ... 332
Tycos Temperature Measures ... 333
Lamatco Used in the Spirit of St. Louis ... 333

Portland Bascule Bridge ... 334

Marine Insurance ... 335

American Shipbuilding ... 341

Trade and Traffic Trends:

United States Needs Cargo Liners, by Alfred H. Haag ... 11 Adv. Section
Economic Factors in Steamship Advertising, by Frederick Sturgess ... 23 Adv. Section
Radio Extends its Utility at Sea, by T. M. Stevens ... 25 Adv. Section
Freights, Charters, Sales ... 26 Adv. Section

Of a General Nature:

Prest-O-Lite Reorganization Note, 334; Recent Haskelite Promotion, 340; Cheaper Water at Honolulu, 340; Wonders of the Deep Sea, by Capt. Frederick B. Bassett, 14 Adv. Section; The Last Word in Whaling, by Frank Bowen, 15 Adv. Section; Who's Who Afloat and Ashore, 17 Adv. Section.

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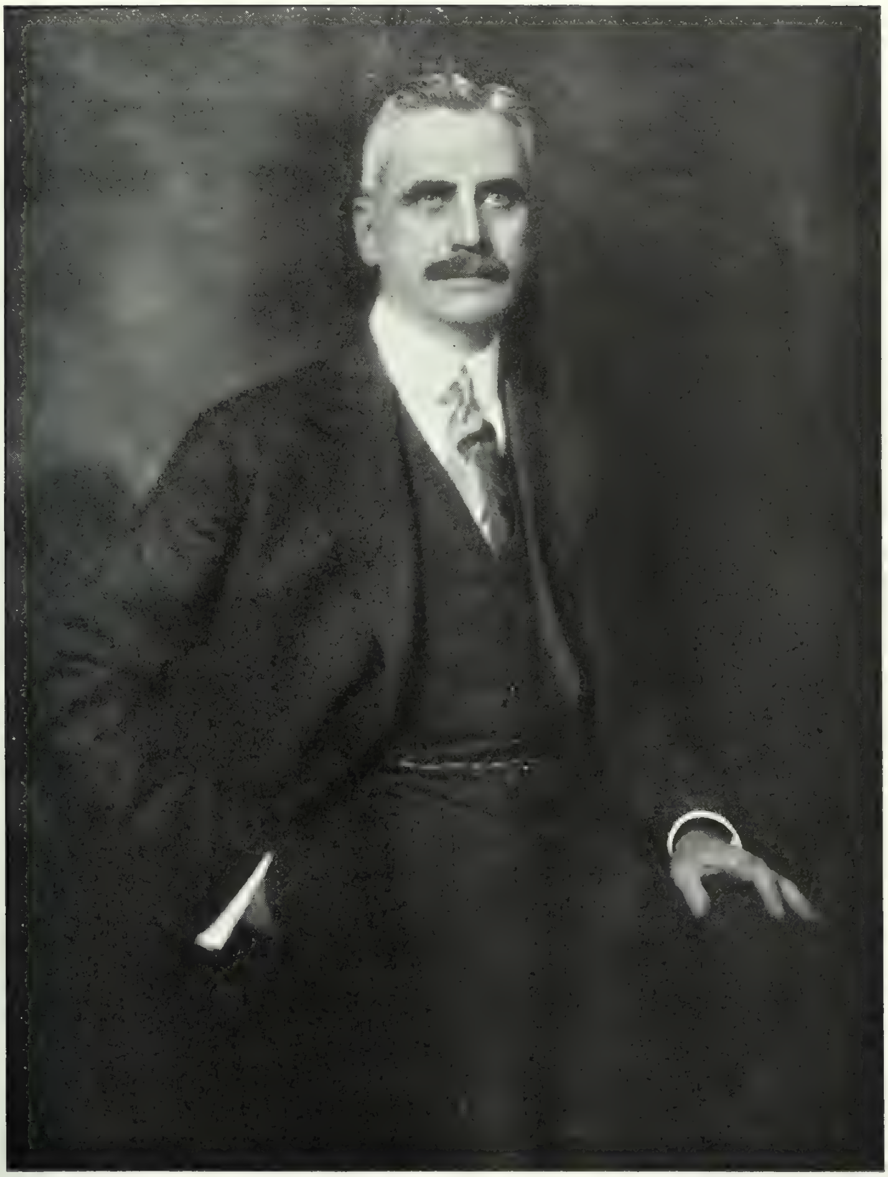

Lewis J. Stone

EXECUTIVE OFFICER OF THE SOUTHERN PACIFIC COMPANY
IN CONTROL OF THE STEAMSHIP LINES

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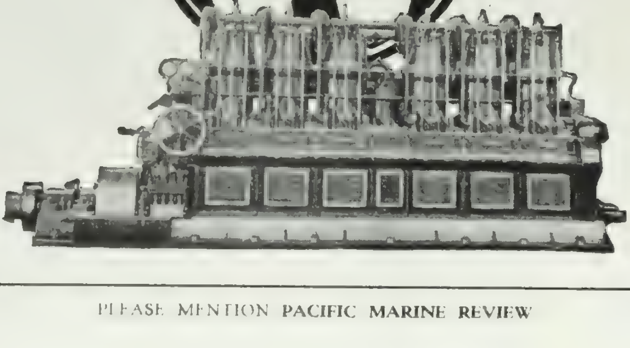

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James S. Hines,
President and Publisher

Bernard N. De Rochie,
Vice-Pres. and Manager.

Official Organ
Shipowners' Association of the Pacific

Alexander J. Dickie
Editor.

Paul Faulkner,
Advertising Manager

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Shipping Profits

IN the English speaking world and in parts of the world whose official language is very far from the favorite tongue of "Kings," there is a very wide spread fallacy that shipowning is an easy pathway to great riches. This fallacy is fostered by skillful propaganda emanating from various class sources and is emphasized through the fact that our press finds so much of news value in those occasional voyages where a ship pays for herself in one round trip or in a few months. The steady, daily grind of hunting for return cargoes which do not exist, or of paying small dividends through long lean years out of surplus carefully hoarded through times of good profit—these do not make interesting copy or good material for headlines.

In the overseas shipping our privately owned American merchant marine has for many years past been practically out of the picture, and we have been trying to show Congress that something must be done about it. Our laws and regulations affecting shipping are, in the main, obsolete and even the most modern of them are in their substance and in the manner of their application calculated to retard rather than encourage the progress of American overseas shipping. No Congress has yet considered seriously the paying of subsidies to offset the operating differential against American ships in foreign trade, although it is shown conclusively by the figures of our own Shipping Board, as published in this issue, that this handicap amounts to at least a 6 per cent net earning on the American cost of vessel.

It is an acknowledged fact that the shrewdest ship operators in the world are our British cousins. Their laws and regulations allow of much more flexible combinations among shipping companies and are calculated to expedite, rather than to retard, the ship. Their largest and most powerful shipowning and operating group, the Royal Mail Steam Packet Company, was able, on its 1926 showing, to declare a 4 per cent dividend. The combined fleets operated by this company now aggregate, including the recently acquired White Star liners, 2,639,193 gross tons. Exclusive of the White Star and responsible for the dividend noted above, there were handled in 1926 over 1,165,000 passengers and over 12,150,000 tons of cargo. The Royal Mail Steam Packet Company has been operating under profitable mail contracts on some of their lines and has enjoyed very favorable loans from the British Government on new ship construction.

Pacific Coast shipowners in foreign trade are perhaps more directly concerned with Japanese competition, and here again, when we look into the official figures, we get somewhat of a shock. We have before us a statement from the Japanese Department of Finance covering the operations and earnings of 80 Japanese steamship companies for the year 1925. These companies operated 1385 vessels, aggregating 2,204,849 gross tons, on a paid-up capitalization of 366,094,458 yen and paid in dividends 13,190,843 yen, or 3.6 per cent at the same time, in the aggregate, carrying over to 1926 a loss account of 54,862,878 yen.

The year's work for these 1385 vessels showed a gross earning of 243,692,469 yen and an operating expense of 246,754,500 yen. All the dividends paid were from the companies enjoying shipping subsidies and bounties. Of the four such companies individually listed, the dividend rate ranged from 2.5 to 9 per cent. In no case would a dividend have been possible except for the subsidy and for miscellaneous receipts of income from sources outside of the ships. Total subsidies paid by Japan to these companies in 1925 amounted to 7,281,901 yen.

In view of these figures and taking into consideration what Shipping Board operations cost the federal treasury, it would seem wise that Uncle Sam give more heed to the encouragement of shipowning and operating by American citizens. In overseas shipping, competition is so keen and rivalry so bitter that any government engaged therein is placed at a great disadvantage at international councils when it finds itself **particeps criminis** with or defending itself against the nationals, individual or corporate, of some other world power.

Shipbuilding

FRIENDS of the American shipbuilder and all patriotic American citizens should awaken to the gravity of the present situation in the American shipbuilding industry and the American overseas merchant shipping.

The oldest and most firmly established shipbuilding yards in the country are frankly going out of business. Only in those instances where a shipyard is located strategically for repair work and reconditioning can the organization be held together. In some such yards all idea of building new ships has been given up and the whole organization is lined up for repair work.

Two factors in the picture induce the dyed-in-the-wool shipbuilder to hang on, gritting his teeth. First, the large replacement program which is coming soon in American coastwise freight and passenger fleets, some of which now have many vessels twenty-five years old or over. Incidentally, the largest contracts now in American shipyards are for replacement in this class.

Second, the eternally vernal hope that Congress will do something to make possible private operation of American vessels under ordinary commercial practice in the overseas trade.

It is high time that we scrap our obsolete laws and our obsolete ships and get some new tools in the American merchant marine. Nine-knot freighters will not do in a 14-knot age, and since we pride ourselves on setting the pace in speed, let's get busy and show some class afloat as well as ashore.

Physical Examination for Seamen

CHAIRMAN T. V. O'CONNOR of the United States Shipping Board announces that arrangements have been perfected in all ports of the United States whereby American seamen will hereafter receive thorough physical examinations prior to shipping on vessels of the American merchant marine, and medical departments have been installed in the different Sea Service Bureaus over the country. In ports where the Shipping Board does not have its own physicians, physical examinations will be given by regular medical officers of the United States Public Health Service, acting in conjunction with local officials of the Shipping Board.

In a few ports where these medical examinations have already been tried out, gratifying results have been obtained. Not only are the examinations of value to the vessel personnel, but they have also proved of great economic benefit to the American merchant marine by assuring at all times a supply of seamen who are known to be in the best physical condition.

In announcing the final completion of arrangements for carrying out the joint program of physical examinations, Chairman O'Connor comments on the excellent cooperation given by the officials of the U. S. Public Health Service. He states that as a result of this cooperation American ships will be manned by as fine a class of seamen as exists anywhere in the world.

Douglas Fir Rebuilds Constitution

AFTER many months of investigation and comparison of various woods, the Navy Department has decided upon Douglas fir to be used in rebuilding the famous old U. S. Frigate Constitution. The contract for 150,000 feet of Douglas fir structural grade decking, timbers, and ceiling was placed with the Chas. R. McCormick Lumber Company. All of the order was cut from McCormick stands of old growth Douglas fir timber and manufactured in the McCormick mill at St. Helens, Oregon. It was shipped in the vessel Chas. R. McCormick, and was delivered in good condition to the Boston Navy Yard.

For over a hundred years the old Constitution has been a shrine and an emblem of liberty for millions of Americans. It is best remembered and loved for the victory of 1804 when the Constitution bombarded Tripoli, exacted peace, and stopped Corsair attacks on American ships. During the War of 1812, the brilliant victory of the Constitution over the British frigate, the Guerriere, and the destroying of the pride of the English Navy, restored the morale of the country. In 1830 the Constitution was condemned as unseaworthy and ordered broken up. It was then that Oliver Wendel Holmes wrote his famous poem Old Ironsides, arousing such a storm of protest that the historic wooden frigate was saved, and she has floated the Stars and Stripes under every President, from Washington to Coolidge.

During the past year American school children have raised the funds that are being used for the rebuilding of the Constitution. She was built almost entirely of oak, and in the reconstruction naval engineers demanded a wood of great strength and adaptability for the many purposes for which wood is needed in the old frigate. A great deal of rivalry developed between the various lumber regions of the United States in furnishing these timbers, but the order was finally awarded to Douglas fir lumber and the Chas. R. McCormick Lumber Company for their ability to meet specifications and give necessary prompt delivery. Within a few hours after the order was placed, the logs were being selected specially for the order and arrangements were made to ship the entire lot on a fast McCormick vessel out of the Columbia River for the East Coast.

America's Travel Ration 303 Miles

DID you get your 303 miles of railroad travel last year?

If not, someone must have traveled that distance for you, for, according to F. S. McGinnis, passenger traffic manager for Southern Pacific, the Class 1 railroads during 1926 performed an average service to the American citizen equivalent to transporting him that distance.

The total number of miles for which passengers paid fare during the year amounted to 35,486,926,000 miles, or 303 miles for every man, woman, and child of our population. A total of 860,343,000 passengers traveled during the year.

Southern Pacific in 1926, on its Pacific Lines alone and exclusive of suburban travel, carried 11,320,833 passengers a total distance of 1,348,325,375 miles. So safe has railroad travel become that not one of these passengers was killed or seriously injured due to accident to the company's steam trains, although some of the most extensively patronized, such as the 63-hour Overland Limited to Chicago, were operated on faster regular schedules than ever before had been attempted.

Safety at Sea

Instruction designed to insure special vigilance in safeguarding the lives of American vacationists who travel on ships, have been issued to the Steamboat Inspection Service, the Supervising Inspector General, D. N. Hoover, announced orally on June 11.

"The Steamboat Inspection Service," said Mr. Hoover, "is one of the oldest governmental activities under the supervision of the Department of Commerce. It is charged with the duty of insuring, as far as possible, the safety of life and property at sea and its staff of 362 inspectors and assistants are scattered in 61 ports throughout this country. The best commentary on the accomplishments of the Service is the fact that the average loss of life each year on boats coming under its supervision is 1 to every 6,000,000 passengers transported."

The Operating Differential of American Ships

A Statement of the Handicaps Against American Vessels Engaged in Foreign Trade

By **Norman F. Titus, Chief, Transportation Division**
Bureau of Foreign and Domestic Commerce

THE merchant marine problem is with us perennially. Newspapers and magazines keep the subject constantly before the American people and every session of Congress finds it a live issue and the subject of much debate. If the layman attempts to investigate the matter and determine what all the uproar is about, he speedily learns that the meat in the cocoanut is the American operating differential; in other words, the handicap of higher costs for ship construction, repairs, wages, or subsistence under which an American vessel labors in competition with foreign vessels. Very naturally, the layman asks for details concerning this burdensome differential only to receive the vaguest kind of answers; even acknowledged experts are inclined to refer to varying amounts anywhere from 10 to 50 per cent.

All observers agree that some form of government aid is necessary to overcome the American operating differential. It is, therefore, vital that this most important matter be clearly and definitely understood.

The United States Shipping Board has accumulated much data on this subject and the following tables epitomize this information by setting forth exactly what this operating differential really is and reveal the percentage of handicap that a large number of vessels of various types and sizes encounter. In the light of the constant recurrence of this subject, this definite information should prove most timely.

EDITORIAL COMMENT

In the table at the bottom of this page will be found a summary of the capital and operating differentials against American ships of various types as compared with similar types in seven British examples and one German example. Assuming that the figures are correct, we yet find in this table two of the reasons why there seems to be so much difference of opinion about the percentage of differential. The United States Shipping Board figures the differential percentages on the cost of the American ship. The shipowner would, we feel sure, figure these percentages on the lower value of the ship operated by his rival.

Taking the case of the 10,000-ton coal burning freighter, we find that the shipowners method would increase the percentage from 6.67 per cent to 10.43 per cent which would represent the actual ratio favoring the British ship of this type in a war for freights. In other words, after the American ship began to show red ink on the balance sheet, the British ship might still show 10 per cent profit.

Take, again, the diesel tankers in the one comparison with a German vessel. Here the Shipping Board method of figuring shows 8.12 per cent differential in favor of the German ship, while the shipowner, using the same set of figures, would be faced with the fact that when he, operating under the American flag, would show red ink, his German competitor on the same rates would show 14 per cent profit.

The capital differential shown, as well as the differences in cost are evidently, in most of the examples used, based not on actual figures, but on certain assumptions which should be carefully weighed and analyzed in each case before accepting the table as a basis of comparison. European shipping enjoys a more favorable rate of interest in many cases than is obtainable in the United States.

*Capital and Operating Differentials

Nationality of vessel	Type See (a)	D. W. T. (except where otherwise stated)	Cost per D. W. T.	Total Cost	Differentials: Capital 1st Year	Capital 11th Year	Wages 1st Year	Wages 11th Year	Subsistence 1st Year	Subsistence 11th Year	Average Annual Amount	Per Cent
United States	C.B.F.	6,360	95	$704,200	$57,183	$39,710	$21,107	$21,107	$3,262	$3,262	$72,828	9.17
British	C.B.F.	6,360	57	476,520								
United States	C.B.F.	10,000	125	1,250,000	81,000	56,250	12,444	12,444	2,376	2,376	83,448	6.67
British	C.B.F.	10,000	60	600,000								
United States	O.B.F.	6,600	96	636,000	60,192	41,600	16,517	16,517	1,234	1,234	68,747	8.22
British	O.B.F. (Speed 9 to 11 knots)	6,800	57	501,600								
United States	C.C.B.F.& P.	17,251 gross tons		6,750,000	402,000	281,250	27,495	27,495	11,500	11,500	362,120	5.66
British	C.C.B.F.& P.	21,700 gross tons		4,500,000								
United States	C.O.B.F.& P.	11,900 gross tons		3,375,000	202,500	140,625	23,116	23,116	9,473	9,473	204,162	6.05
British	C.O.B.F.& P.	11,600 gross tons		2,250,000								
United States	S.T.	10,367	110	1,142,570	69,177	46,039	16,609	16,609	2,732	2,732	80,149	7.88
British	S.T.	10,367	73	758,221								
United States	D.T.	10,144	130	1,318,720	82,141	57,042	17,332	17,332	3,607	3,607	90,380	6.85
British	D.T.	10,144	86	862,384								
United States	D.T.	10,144	130	1,318,720	100,421.60	69,740	19,455.60	19,455.60	2,592	2,592	107,130	8.12
Germany	D.T.	10,144	75	760,800								

*Capital differential based on:-
Interest - - 6%
Depreciation - 5%
Repairs - - - 2%
Insurance - - 3%
Total 16%

(a) Abbreviations:-
C.B.F.- - - Coal burning freighter
O.B.F.- - - Oil burning freighter
C.C.B.F.&P. Combination coal burning freighter and passenger
C.O.B.F.&P. Combination oil burning freighter and passenger
S.T. - - - Steam tanker
D.T. - - - Diesel tanker

Source:- United States Shipping Board.

JAN. 3, 1927.

Scale of Wages Per Month in Various Countries

OF ABOUT 4,500 - 10,000 DEADWEIGHT	Sweden	Denmark	Norway	Great Britain	Holland	Germany	Spain	Japan	France	Italy	Belgium
DECK DEPARTMENT	Kroner .267	Kronor .266	Kroner .251	Pound 4.85	Florins .400	Mark .238	Peseta .152	Yen .49	Franc .033	Lira .041	Franc .139
Master	1008	850	830	41¼	475	505	750	200	2760	1750	2300
1st Mate	421	573	450	20	265	280	450	130	1725	1400	1207
2nd Mate	307	437	370	14	187	223	300	95	1207	1200	1031
3rd Mate	232	265	300	11½	120	168	200	85	1063	1050	880
Carpenter	169	230	210	11½	115	116	165	52	510	-	730
Carpenter & Bosun	-	-	-	-	-	-	-	-	-	-	-
A. B. Seamen	135	205	185	9	100	93	135	41	450	500	603
Ordinary Seamen	118	105	100	5¼	50	50	120	38	240	-	440
Radio	217	245	300	14	130	223	-	105	690	1050	800
ENGINE DEPARTMENT											
Chief Engineer	643	700	600	26	325	410	700	180	2070	1750	1585
1st Asst. "	372	493	440	20	225	280	450	100	1265	1400	1207
2nd Asst. "	277	358	357	14	150	223	275	85	1023	1200	1031
3rd Asst. "	220	295	-	11½	110	168	200	65	966	1050	880
Oiler	163	210	210	10	115	111	150	48	510	530	653
Firemen	141	210	190	9½	105	106	150	46	480	530	628
Coal Passers	93	143	110	9	90	90	125	-	450	-	603
STEWARDS DEPT.											
Chief Steward	275	285	440	13½	115	99	150	55	560	515	805
Steward & Cook	202	100	-	8¼	55	60	-	-	510	-	283
Chief Cook	202	220	250	12½	137	117	150	45	660	545	780
2nd Cook & Baker	65	130	-	8½	55	75	-	-	510	-	528
Messboys	65	55	60	3¾	30	26	-	42	170	300	365

Above rates of Exchange as of November 12, 1926. Source: United States Shipping Board. January

	UNITED STATES		OF ABOUT 4,500 - 10,000 DEADWEIGHT										
DECK DEPARTMENT	5001 to 7000 D. W	7001 and Over D. W.	Sweden	Denmark	Norway	Great Britain	Holland	Germany	Spain	Japan	France	Italy	Belgium
Master	$285.00	290.00	269.17	226.36	207.92	145.52	190.05	119.94	113.70	98.00	91.91	72.45	64.12
1st Mate	180.00	185.00	112.41	152.59	112.73	97.01	106.03	66.50	68.22	63.70	57.44	57.96	33.65
2nd Mate	160.00	165.00	81.97	116.37	92.69	67.91	74.82	52.96	45.48	46.55	40.19	49.68	28.74
3rd Mate	145.00	150.00	61.94	70.57	75.15	55.78	48.01	39.90	30.32	41.65	35.40	43.47	24.54
Carpenter	-	80.00	45.12	61.25	52.61	55.78	46.01	27.55	25.01	25.48	16.98	-	20.35
Bosun	-	75.00	43.52	61.25	52.61	50.93	46.01	27.55	30.32	27.93	16.98	25.88	18.90
Carpenter & Bosun	75.00	-	-	-	-	-	-	-	-	-	-	-	-
A. B. Seamen	62.50	62.50	36.05	54.59	46.34	43.66	40.01	22.09	20.47	20.09	14.99	20.70	16.81
Ordinary Seamen	47.50	47.50	31.51	27.96	25.05	25.47	20.01	11.88	18.19	18.62	7.99	-	12.27
Radio	105.00	105.00	57.94	65.24	75.15	67.91	52.01	52.96	-	51.45	22.98	43.47	22.30
ENGINE DEPARTMENT													
Chief Engineer	$250.00	260.00	171.68	186.41	150.30	126.12	130.03	97.38	106.12	88.20	68.93	72.45	44.19
1st Asst. "	180.00	185.00	99.32	131.29	110.22	97.01	90.02	66.50	68.22	49.00	42.12	57.96	33.65
2nd Asst. "	160.00	165.00	73.96	95.34	89.43	67.91	60.02	52.96	41.69	41.65	34.07	49.68	28.74
3rd Asst. "	145.00	150.00	58.74	78.56	-	55.78	44.01	39.90	30.32	31.85	32.17	43.47	24.54
Oiler	72.50	72.50	43.52	55.92	52.61	48.51	46.01	26.36	22.74	23.52	16.98	21.94	18.21
Firemen	67.50	67.50	37.65	55.92	47.60	46.08	42.01	25.18	22.74	22.54	15.98	21.94	17.51
Coal Passors	60.00	60.00	24.83	38.08	27.56	43.66	36.01	21.38	18.95	-	14.99	-	16.81
STEWARDS DEPT.													
Chief Steward	$ -	120.00	73.43	75.90	110.22	65.48	46.01	23.51	22.74	26.95	18.65	21.32	22.44
Steward & Cook	120.00	120.00	53.93	26.63	-	40.02	22.01	14.25	-	-	16.98	-	7.85
Chief Cook	-	100.00	53.93	58.59	62.63	60.63	54.81	27.79	22.74	22.05	21.98	22.56	21.75
2nd Cook & Baker	80.00	80.00	17.36	34.62	-	41.23	22.01	17.81	-	-	16.98	-	14.72
Messboys	42.00	42.00	17.36	14.65	15.03	18.19	12.00	6.18	-	20.58	5.66	12.42	10.18

Rates of Exchange as of November 12. 1926. Source: United States Shipping Board. January 3, 1927

Analysis of Board and Wage Costs In World's Merchant Marine

Wage and Subsistence Differentials American and Foreign Vessels of Similar Types and Sizes

Nationality of Vessel	Tonnage D. W. T.	Type	Propulsion	Fuel	Monthly Payroll	Monthly Subsistence	Number of Crew	American Handicap in Percentage	
								Payroll	Subsistence
United States	10,144	Tanker	Diesel	----	$3,677.50	$820.80	38	56	44
Belgium	11,706	Tanker	Diesel	----	1,607.10	456.30	39		
United States	8,720	Tanker		Oil	3,944.00	799.20	37	73	50
France	7,500	Tanker		Oil	1,047.60	399.00	36		
United States	9,012	Cargo		Coal	3,636.00	756.00	42	74	43
France	9,200	Cargo		Coal	993.29	432.00	46		
United States	8,622	Cargo		Coal	3,636.00	756.00	42	39	13
British	8,700	Cargo		Coal	2,337.26	655.20	42		
United States	6,600	Cargo		Oil	3,278.50	612.00	34	36	6
British	6,575	Cargo		Oil	2,115.54	574.88	36		
United States	8,360	Cargo		Coal	3,756.00	738.00	41	47	36
British	8,300	Cargo		Coal	1,997.18	478.80	38		
United States	9,426	Cargo		Coal	4,016.00	810.00	46	56	31
British	9,300	Cargo		Coal	1,756.15	556.00	74		
United States	8,191	Cargo & Pass.		Oil	5,849.00	1,242.00	69	65	50
British	9,600	Cargo & Pass.		Oil	2,064.48	622.20	85		
United States	9,426	Cargo		Coal	4,016.00	810.00	46	45	34
British	9,600	Cargo		Coal	2,195.88	536.00	40		
United States	10,367	Tanker		Oil	3,463.50	702.00	34	45	32
British	10/11,000	Tanker		Oil	1,916.10	474.30	31		
United States	10,144	Tanker	Diesel	----	3,677.50	820.80	38	39	37
British	10/11,000	Tanker	Diesel	----	2,233.20	520.20	34		
United States	11,900	Pass. & Cargo		Oil	13,562.75	3,570.41	214	14	22
British	11,600	Pass. & Cargo		Oil	11,636.40	2,781.00	206		
United States	17,261	Pass. & Cargo		Coal	16,706.00	4,650.34	267	14	21
British	21,700	Pass. & Cargo		Coal	14,414.71	3,672.00	272		
United States	10,000	Cargo		Oil	3,387.00	738.00	41	31	27
British	10,000	Cargo		Oil	2,350.00	540.00	40		
United States	10,367	Tanker		Oil	3,463.50	702.00	34	42	32
British	10,300	Tanker		Oil	2,006.10	474.30	31		
United States	10,144	Tanker	Diesel	----	3,677.50	820.80	38	34	36
British	10,050	Tanker	Diesel	----	2,411.70	535.50	35		
United States	8,114	Cargo		Coal	3,756.00	738.00	41	74	52
Italy	8,600	Cargo		Coal	981.96	357.00	34		
United States	10,009	Cargo		Oil	3,369.00	630.00	36	69	45
Italy	10,000	Cargo		Oil	1,034.94	346.50	33		
United States	11,550	Cargo		Oil	3,368.50	630.00	35	66	30
Italy	10,000	Cargo		Oil	1,140.00	441.00	42		
United States	8,720	Tanker		Oil	3,944.00	799.20	37	63	35
Italy	8,600	Tanker		Oil	1,457.70	516.60	41		
United States	10,144	Tanker	Diesel	----	3,677.50	820.80	38	44	39
Germany	13,370	Tanker	Diesel	----	2,066.20	504.00	42		
United States	9,120	Cargo	Diesel	----	3,633.00	648.00	34	47	35
Sweden	9,200	Cargo & Pass.	Diesel	----	1,942.18	420.00	36		
United States	6,300	Cargo		Coal	3,283.50	630.00	35	47	36
Sweden	6,220	Cargo		Coal	1,733.63	405.00	34		
United States	9,962	Cargo		Oil	3,358.50	630.00	36	63	50
Japan	9,730	Cargo		Oil	1,162.73	315.00	35		
United States	9,400	Cargo		Oil	3,368.50	630.00	36	68	51
Japan	9,090	Cargo		Oil	1,065.58	306.00	34		
United States	9,758	Cargo		Coal	3,636.00	756.00	42	68	55
Japan	10,661	Cargo		Coal	1,226.43	342.00	36		
*United States	13,870 gross tons	Cargo & Pass.		Oil	7,936.25	2,599.20	124	41	51
*Japan	11,790 gross tons	Cargo & Pass.		Oil	4,694.77	1,268.40	111		
United States	12,000	Tanker		Oil	4,062.00	820.80	39	48	39
Norway	11,790	Tanker		Oil	2,124.60	504.00	36		
United States	7,390	Cargo		Coal	3,711.00	736.00	41	46	48
Norway	7,100	Cargo		Coal	1,720.39	384.00	32		
United States	3,000	Cargo		Coal	3,228.50	630.00	35	51	58
Norway	2,510	Cargo		Coal	1,561.25	264.00	22		
United States	7,503	Cargo		Coal	3,711.00	733.00	41	54	53
Norway	7,500	Cargo		Coal	1,697.00	343.00	29		
United States	6,248	Cargo		Oil	3,008.80	556.00	31	22	25
Norway	6,000	Cargo		Oil	2,346.52	420.00	33		
United States	8,646	Cargo		Coal	3,724.00	733.00	41	39	41
Norway	6,600	Cargo		Coal	2,266.71	432.00	36		

* Based on a partial month and crew.

Source: United States Shipping Board.

JAN. 3, 1927.

The Sewall Big Four, IV

The Roanoke, Largest Wooden Merchant Ship Ever Built

By F. C. Matthews

The American ship Roanoke

THE Roanoke, the largest wooden merchant ship ever built, was launched September 20, 1892. She was 311.2 feet long, by 49.2, by 29.2; 3530 tons, gross; 3400 net, per register. She had three complete decks. Her keel was of white oak in two tiers 16 inches square; garboards 8 inches thick; ceiling in lower hold 14 inches; water ways, 14 by 14. She was thoroughly fastened with locust treenails, and bolted and edge bolted and no pains were spared to make her as strong a vessel as could be constructed of wood. Her spars were massive sticks of Oregon pine, the lower masts being 38 inches in diameter and a little over 90 feet long. The steel spike bowsprit was 68 feet long and 45 feet outboard. Her accommodations were exceptionally fine and her cabins royally finished and furnished. She was designed for the California trade and Captain Joseph P. Hamilton was appointed to the command.

The Roanoke is claimed to have been a fairly good sailer before the wind but rather dull on the wind, and during her sea life of some twelve years she has no fast complete passage to her credit. Her best day's work during one period of five years was 320 nautical miles. However, on her passage to San Francisco in 1895-1896 she was favored with strong winds and trades in the Pacific and made the run from 50 south to the line in 19 days and was 17 days thence to sighting the Farallon Islands, her time over each of these sections, as also over the combination of the two, being close to old time clipper records.

Leaving New York on her maiden voyage December 18, 1892, the Roanoke grounded on the West Bank but was hauled off and proceeded. The Susquehanna left New York three days later and both reached San Francisco April 22, 1893, entering port on the same tide, Susquehanna slightly in the lead, her time being 122 days against 125 days of Roanoke. Both of these passages were, however, eclipsed by that of the Jabez Howes arriving two days later in 106 days from New York. The Howes had gained on her competitors about one week in the North Atlantic and was but 13 days making the Cape Horn passage against Roanoke's 18½ days and Susquehanna's 17 days. The crossings of the Pacific equator were: Howes, 85 days out; Susquehanna, 101; and Roanoke, 102 days out.

From San Francisco the Roanoke returned to New York direct, making the passage in 111 days, and leaving the latter port March 10, 1894, took out to Shanghai the largest cargo ever laden on a sailing vessel up to that time, 126,500 cases of coal oil.

On June 20, 1895, the Roanoke left New York for San Francisco and was 40 days to the line. She lost the southeast trades in latitude 18 and from there to 44 South had very hard gales and heavy seas, losing three men through falls from aloft, two being killed on striking the deck, the other going overboard. Many others of the crew had been injured and on August 28 Captain Hamilton bore up for Montevideo, having only eight men left fit for duty. Being unable to fetch the Uruguayan port, the ship was kept on for Rio which was reached September 15. Sixteen of the crew were sent to the hospital. The ship sailed from Rio October 28 and arrived at San Francisco 87 days later, January 23, 1896. Completing this, her third voyage, she took a cargo of sugar from Hilo, Hawaiian Islands, to New York, making the run in about 120 days.

Her fourth voyage was from New York to Yokohama with case oil; thence to Honolulu and from there, 98 days, to New York with sugar. Captain Hamilton died on the latter passage and Chief Mate Chad Thompson, completed the voyage, being appointed to the command after the arrival. Captain Thompson, a native of San Francisco, remained in the ship until 1899 when he was transferred to the Sewall ship Iroquois at New York and after her loss, he took the Homeward Bound, steel bark, originally the British ship Zemindar. He is now a highly respected business man of San Francisco.

On May 13, 1898, the Roanoke anchored in San Francisco Bay after an eventful passage of 140 days from New York, during which three men fell from aloft, one being killed, the others lost overboard; another seaman died of consumption. From San Francisco the ship returned to New York in 102 days, being up with Sandy Hook on the 99th day out, then being blown offshore. Captain Thompson reported having had a succession of very heavy gales in the South Pacific; off the Horn shipped a sea which stove the wheel house and flooded the cabins; off the Platte lost several sails. He made the run from Cape Horn to the line in 21 days, thence 26 days to Sandy Hook.

The command of the Roanoke now went to Captain

J. A. Amsbury, formerly in the ship William H. Macy, and his first voyage in the big ship was from New York to San Francisco, thence to Liverpool, and from there to Baltimore where a coal cargo was laden for San Francisco. The start of this latter voyage was unpropitious, the ship taking the ground on her way to sea March 7, 1900, and being obliged to lighter a portion of her cargo to get afloat. She finally left Baltimore March 13, and had a fairly good run to Staten Land, thence to Cape Horn, a distance of about 250 miles. She was 20 days in heavy gales, with snow and sleet squalls at frequent intervals, and was 34 days between the two 50's. The Roanoke arrived at San Francisco August 17, 156 days from Baltimore. She went thence to Liverpool in 139 days.

On January 7, 1902, the Roanoke reached San Francisco 206 days out from Baltimore, via Honolulu 19 days. She put into the latter port with her coal cargo on fire and there discharged 3900 tons; the remaining 1000 tons were carried to San Francisco. Repairs costing $20,000 were made and after loading 4600 barrels of wine, 100 tons of asphalt, and 11,000 cases of canned salmon, she proceeded to Seattle and completed her loading with 120,000 additional cases of salmon. Taking her departure from Seattle May 11, 1902, she made the run to New York in 125 days.

In August, 1905, the Roanoke was loading chrome ore at Noumea, New Caledonia, for the Delaware Breakwater. Lighters had delivered 3085 tons when on August 10, fire was discovered in the forward hold. In spite of all that could be done by her crew of 32 men assisted by the crews of the ship Susquehanna and the Norwegian bark Arabia, the fire got beyond control and all hands were driven over the sides of the ship into small boats, from which they witnessed the destruction of the magnificent ship. The mate of the Susquehanna who had been particularly active in the fight against the fire was almost overcome and was helpless for some time afterwards.

Captain Amsbury later left for New York and the Susquehanna took her departure after completing her lading with ore, but she also was lost soon after. These disasters left the Shenandoah sole survivor of the Big Four.

Another Legislative Straw

THE National Marine Association has heretofore made reference to Acts of Congress which have been passed as a direct means of aiding shipping, the provisions of which have never been enforced, and in consequence the benefits intended never realized by the shipowners, notwithstanding during the pendency of the measure in Congress great things were promised and renewed hope inspired in the hearts and minds of those who go down to the sea in American ships. The public gets the impression that the laws are in operation and therefore cannot understand why, with this continual aid by the government, American ships cannot keep on the seas. In time they really tire of the subject and, we take it, lose interest to a certain extent. Some may even think the shipowner is never satisfied. As a matter of fact, the man with his money in ships gets little from his investment.

As another example of laws which are enacted to aid shipping and which do not provide that assistance which the shipowner is promised and the public believes he obtains, we have only to refer to Section 23 of the Merchant Marine Act of 1920. Under this section shipowners were permitted to impound for a period of ten years a sum equal to the income taxes that would have been payable on their earnings, provided that such impounded fund should be used in the construction of approved types of vessels in American yards and that such impounded funds should not form more than one-third of the total costs of such vessels.

By this provision it is evident that Congress intended to lend impetus to the American merchant marine by, in part at least, equalizing the difference in capital costs between vessels built abroad and those built in domestic yards, thereby encouraging both shipping and shipbuilding. As profits in the shipping industry in general have been very small, if any, for that portion of the ten years that has expired since the enactment of the Merchant Marine Act, there have not been very many American companies that could take advantage of the provisions of Section 23, but there have been instances where such benefits were sought.

It has now been found, however, that inasmuch as the language of Section 23 refers to exemption from taxes under the Revenue Act of 1918, that its provisions are not applicable to taxes accruing under subsequent Revenue Laws; at least the Income Tax Unit so holds. Consequently, by inadvertence or otherwise, a benefit expressly extended for a period of ten years to American shipping by an Act relating to shipping is rendered ineffective a little more than a year later by a measure relating solely to revenue. As has heretofore been pointed out, almost every other aid to shipping that has been enacted into law has become inoperative either by virtue of failure of enforcement, by being held unconstitutional, or by virtue of circumstances identical with or similar to those surrounding Section 23 of the Merchant Marine Act of 1920.

Such a situation is certainly most deplorable and Congress should remedy it in part at least at the first opportunity by evidencing its sincerity in enacting Section 23 of the Merchant Marine Act by passing an amendatory measure restoring the effectiveness of that section as originally contemplated.

(Bulletin No. 23, National Merchant Marine Association.)

New Coast Guard Cutter Northland

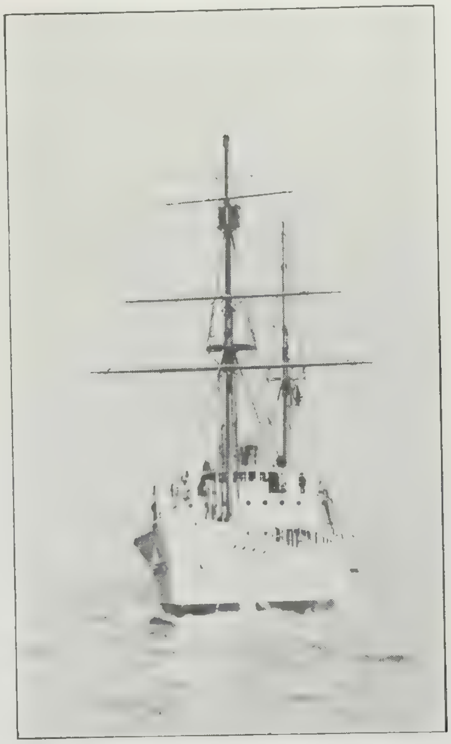
A Modern Steel Vessel With Diesel-Electric Propulsion Takes on the Arctic Work of the Historic Steamer Bear

FOLLOWING a ten-day shakedown trial, the new diesel-electric coast guard cutter Northland is now on her way to the Bering Sea, where she will be permanently stationed to continue the work of the historic Bear in iceberg patrol work and other humanitarian service in the Arctic. The final test period was started May 14. The Northland is the first coast guard cutter to be equipped with diesel-electric drive.

The old Bear built as a sealer in Greenock, Scotland, in 1874, was acquired by the United States coast guard in the early eighties and for years patrolled the ice lanes of the Arctic waters, performing notable rescues and on several occasions herself being rescued from being crushed to pieces in the ice. Now, instead of scrapping the old boat, she will probably be used as a training ship for young recruits.

Captain Claude S. Cochran, commander of the Bear and associated with her later adventures, will go north in command of the Bering Sea patrol force, maintained under the sealing treaty with Great Britain. He will retire in 1929. In her years of service the Bear has given help to crews of whalers and to natives alike. Captain Cochran has held court aboard ship, delivered mail, performed marriage and other ceremonies, and brought justice and mercy into regions which might otherwise have had neither. The Bear figured in the dash to Lady Franklin Bay to rescue the Greely expedition at Cape Sabin. She has gone on half a dozen relief expeditions besides carrying out her ordinary duty.

The Northland, successor to the Bear, was constructed by the Newport News Shipbuilding & Drydock Company during the years 1926 and 1927 and was given her first sea trials at Newport News on April 26. She is designed for a speed of 12 knots, being driven by a single propeller running at a speed of 120 revolutions per minute. The total shaft horsepower of the propulsion equipment is 1000.



Bow view of Coast Guard cutter Northland.

The power plant of the new boat is extensive, consisting of two main generators, two auxiliary generators mounted on shaft extensions of the main generators, and three independently driven auxiliary generators. All these generators are driven by diesel engines, those for the main generators being built by the McIntosh & Seymour Corporation, two of the auxiliary engines being of Winton make and the other of Cummins manufacture. Power for the propulsion equipment is supplied by the main generators, while the auxiliary generators supply power for operating various auxiliaries, for lighting, and for excitation.

Practically all of the electrical equipment is of General Electric manufacture. The main generators are of the compound-wound type, each being rated 410 kilowatts, 200 revolutions per minute, 250 volts. The auxiliary generators on the shaft extensions are each rated 75 kilowatts, 120 volts; two of the remaining three are rated 60 kilowatts, 550 revolutions per minute, 120 volt each, and the third is rated 18 kilowatts, 120 volts.

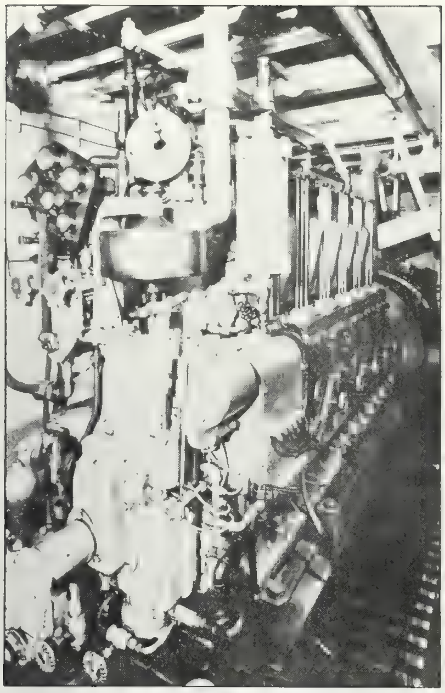
The main drive motor is of the double - armature type, consisting of two motors mechanically connected to operate as one. Each section is rated 500 horsepower, 120 revolutions per minute, 250 volts, and is shunt wound.

In addition there is an 18-kilowatt motor-generator set consisting of a direct-current generator and an alternating current motor. This is so arranged that shore power can be used when it is desired to shut down the vessel's power plant.

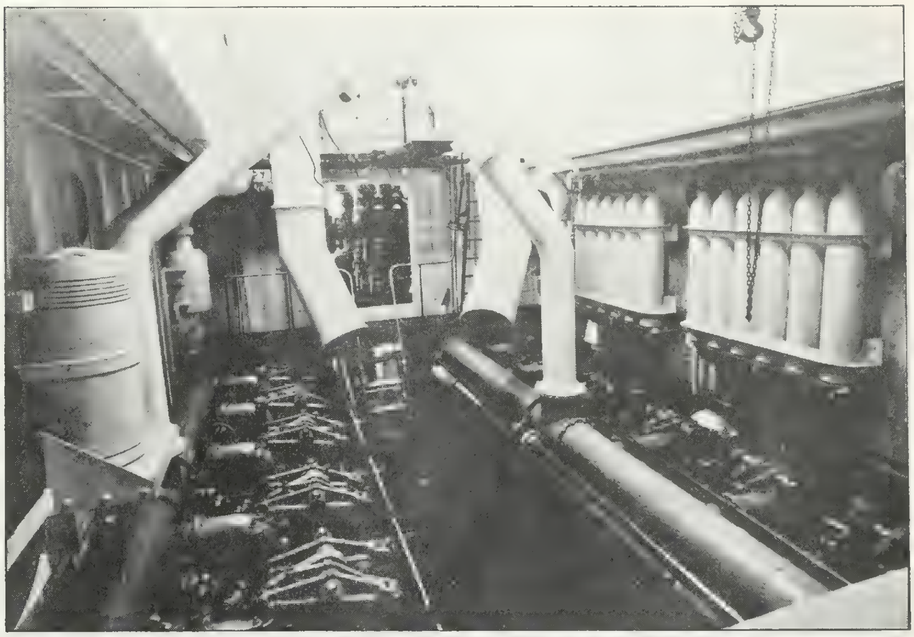
The main control is of the variable voltage type, providing for engine room control. The thrust bearing for the propellor shaft is of the General Electric Spring-thrust type.

A novel installation has been made of an electric clutch for the propelling element. The motor and

Broadside view of Northland from the starboard forward quarter.



Auxiliary Winton-General Electric generating set.



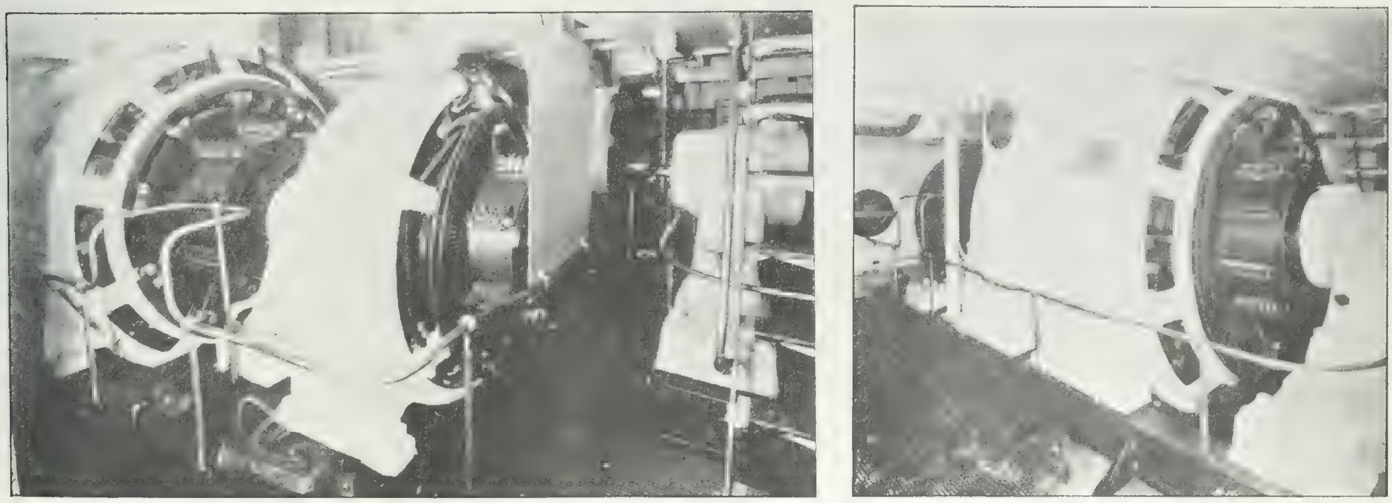
View looking aft in the engine room of the Northland across the cylinder tops of her two McIntosh & Seymour diesel engines. Note the Lux cylinders on the port bulkhead.

shaft are rigidly bolted under normal conditions but, when cruising at reduced power in the ice fields, the bolts will be removed and the electric clutch used. This clutch will transmit a torque equivalent to 500 shaft horsepower at 95 revolutions per minute, but an excess will cause slipping of the clutch and thus prevent undue stresses.

Among the electrically driven auxiliaries are an anchor windlass, a gypsy, ventilating fans, machine shop tools, circulating pumps, fire pumps, fresh water pumps, fuel transfer pumps, tank heater pumps, an auxiliary air compressor, refrigerating equipment, a boiler feed pump, a portable sump pump, a fuel oil separator, a lubricating oil separator, and the electro-hydraulic steering equipment. These are driven by a total of 22 motors having an aggregate horsepower of 189. In addition, there is a switchboard consisting of three sections, one for auxiliary generators, one for power distribution and one for lighting.

Radio Equipment

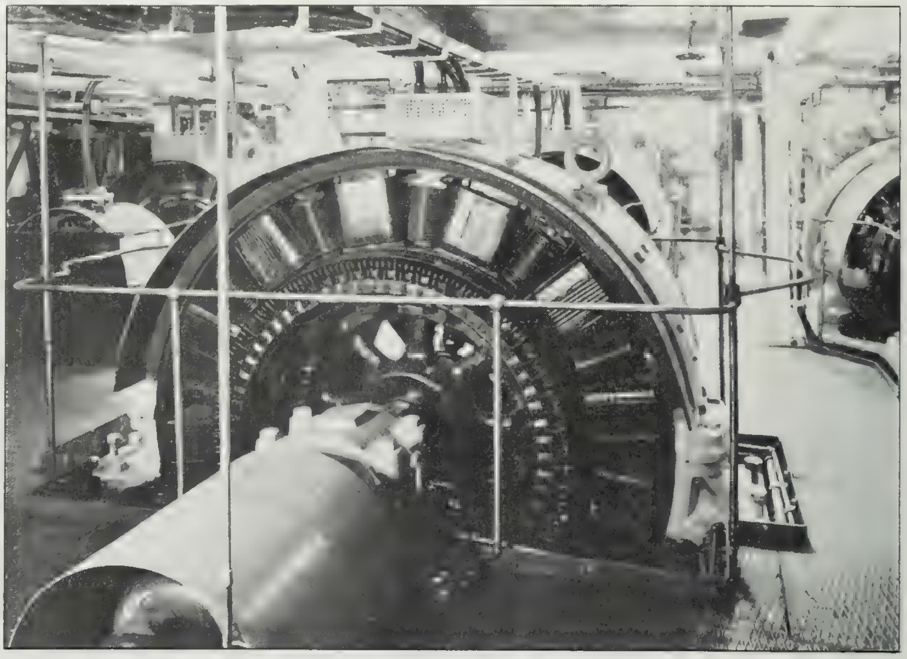
A complete radio installation is also included among the ship's equipment. Of outstanding importance is the 2000-watt transmitter of General Electric manufacture. This set, although high in power, is made in a compact form to fit in the small radio room of the boat. The transmitter provides for communication by means of pure continuous wave telegraph, and tone modulated telegraph. The tone modulation is "sine wave" in form, giving a clear musical tone easily read through static and interference. The tone is provided by a small motor-generator set with an output of only one-tenth of a watt. Radio panels are of the "dead front" type. Thus the operator is not exposed to dangerous voltages if thrown against the set during a heavy sea. The outfit is so designed that the emitted wave length or frequency is absolutely independent of any variations caused by rolling or pitching of the ship. A vacuum tube known as Model UV-851 is used in the transmitter. It is rated at 2000 volts on the plate and has an output of 1000 watts. By the use of this low impedance tube plate power can be supplied from a direct-current motor-generator set.



Two views in the electric power station of the Northland. At left, the two main generating sets with their exciters; and, at right, the main propulsion motor. The large black disc on bulkhead after the motor is magnetic clutch. All of this machinery is General Electric.

Diesel-Electric Propulsion Gains Favor

By H. C. Coleman, Marine Engineering Dept.,
Westinghouse Electric & Manufacturing Co.



The engine room of the Steel Electrician. In the foreground the main propulsion motor, 750 horsepower at 135 revolutions per minute. In the background the three 300-horsepower Nelseco diesel engine generating sets. The motor and generators are Westinghouse.

REPORTS of the United States Steel Products Company on their Lake freighters show that the Westinghouse diesel-electric driven Steel Electrician has made more trips and carried more cargo per trip during her first season than any of her direct diesel driven sister ships, although she has a slightly smaller total shaft horsepower. And in further comparison with these motorships, indications are that the total fuel consumption of the Steel Electrician has equaled or bettered that of any of them. In fact, the vessel has been so satisfactory in all respects it is anticipated that she is the forerunner of more Lakers fitted with diesel-electric drive.

The Steel Electrician, although not nearly as large as the Lake ore carriers, because of the dimensions of the locks of the Welland Canal through which she must pass in her regular trade, is constructed along similar lines in that the propulsion machinery is all located as far aft as possible, with an after deck house for the engine room force and with the wheel house and quarters for deck officers and deck hands forward. The vessel is designed for carrying steel plates, rails and structural shapes and is, therefore, provided with two large cargo hatches, each 40 feet by 20 feet, and each opening into a cargo hold about 80 feet long. Special provision is made for handling the cargo, much of which is in very large pieces, by two 5-ton electric revolving cranes, similar to the usual land locomotive crane, which replace the usual deck winches. The vessel is unique in this respect, along with its sister ships, the Steelvendor, Steelmotor, and Steel Chemist. These vessels are all of the same size except for a few inches in the over-all length, and are practically duplicates in all details except for machinery arrangement. Each of the first two above named ships is propelled by a 750-shaft horsepower, 135 revolutions per minute, 6-cylinder, 4-cycle, air-injection diesel engine, while the Steel Chemist has a 950-horsepower, 165 revolutions per minute, 6-cylinder, double-acting, air-injection diesel engine.

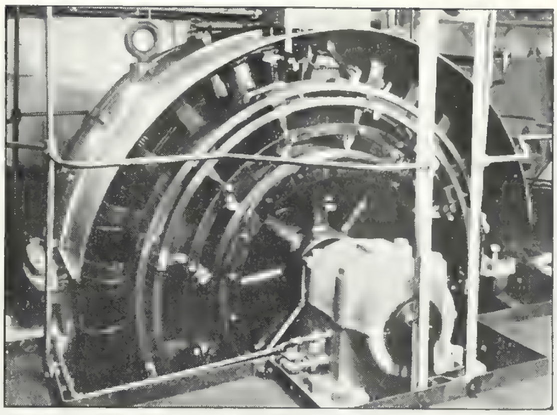
The following are the chief characteristics of the Steel Electrician:

Length over all	257′ 11⅝″
Length between perpendiculars	250′ 0″
Beam, molded	42′ 9″
Depth, molded	20′ 0″
Load draft (Lake service)	14′ 0″
Gross tonnage	1694
Net tonnage	974
Propulsion motor, main engines	750 S.H.P.

The Steel Electrician and her sister ships were designed and built by the Federal Shipbuilding & Drydock Co., Kearney, New Jersey. For the Steel Electrician, the builders chose three 300-horsepower, 225 revolutions per minute, 4-cylinder, 4-cycle, airless injection main diesel engines of the new M. A. N. type as manufactured by the New London Ship & Engine Co., Groton, Connecticut, and complete electrical propulsion equipment and underdeck auxiliary motors and control built by the Westinghouse Electric & Manufacturing Co. Each main engine drives a 205-kilowatt, 230-volt, main generator and a 30-kilowatt, 230-volt exciter. The main generators furnish power to the 750-horsepower, 690-volt, 135 revolutions per minute, single unit propulsion motor. Each engine, generator, and exciter is mounted on a cast base, and a heavy duty pedestal bearing is fitted between the generator and exciter, with the exciter armature overhung. This arrangement makes a very compact unit and one which is easily handled in installation. The three generating sets are arranged abreast of each other with the center set moved forward slightly to make room for the propulsion motor. The switchboard is located on a platform directly above the motor, thus affording the switchboard attendant a complete view of all the main machinery. This gives a very spacious and clean-cut engine room with easy access to all parts of the machinery.

The main generators, exciters, and propelling motor are of the open, self-ventilated type, but are fitted with sheet steel covers to protect from dripping or mechanical injury. The main generators and propelling motor are straight shunt wound machines connected in series and arranged for the full voltage control system, which the Westinghouse Company has used on the large number of vessels it has equipped with diesel-electric drive. A very simple potentiometer type rheostat is used for varying the generator field excitation in 50 steps from zero to full value in either direction. The motor field is excited at constant value and in one direction. Under this condition, a variation in the generator excitation will produce a like variation in the motor speed, and hence the propeller speed. Complete control of the propeller is, therefore, effected from the pilot house by handling only the small field current of the generators and without opening a circuit of any kind. The potentiometer rheostat is mounted just beneath the pilot house floor and is operated through bevel gears and shafting from a control pedestal similar to a standard engine room telegraph stand, located in the pilot house alongside the steering control stand. A duplicate control station is provided at the switchboard in the engine room for emergency use. Complete control may be instantly transferred from one station to the other by manipulation of a switch on the main switchboard.

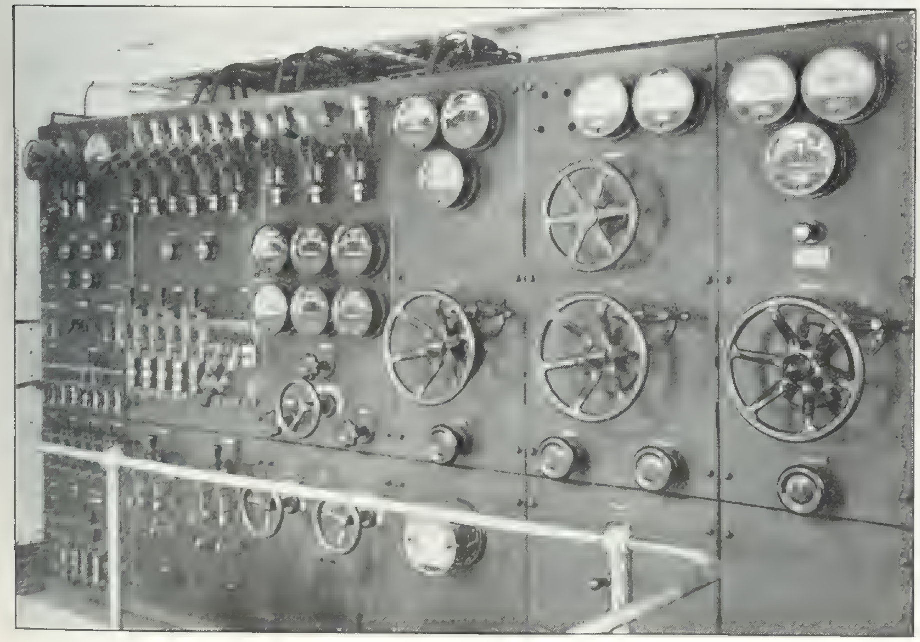
It has been found that one of the chief advantages of the Steel Electrician over her sister ships is the flexibility and positive control available with this full voltage control system operated from the pilot house. This system affords the highest refinement of control and at the same time utilizes the simplest arrangement of apparatus and of electrical circuits. An indication of the refinement of control is shown by the fact that on the Steel Electrician, the speed of the propeller may be varied directly from the pilot house in 50 progressive steps of less than 3 revolutions per minute each from the "Stop" position to full speed of 135 revolutions. This range of control is, of course, available either ahead or astern. The ability to regulate the speed directly from the pilot house in such small increments and over the entire range affords a marked improvement over the direct diesel driven ship where it has been found impossible to get down to speeds as low as desired, even when cutting out three of the six cylinders during this operation. This will readily show why the Steel Electrician, during her past season's operation has made much better time through the Welland Canal and other restricted places than her sister ships.



Close-up of the 750-horsepower Westinghouse propulsion motor on the Steel Electrician.

The captain of the Steel Electrician operates the vessel in a manner similar to a driver operating an automobile. There is no guessing or waiting for signals to the engine room to be executed. The fact that the captain controls the vessel himself eliminates most of the hazard of navigating the canal locks and restricted places. This feature alone should be valuable in reducing the chances for damage to both the vessel and the locks.

The growing popularity of this type of drive is evidenced by the fact that we now have diesel-electric yachts, trawlers, tugs of all kinds, ferryboats, fireboats, seagoing and other types of dredges, sternwheel river boats, tankers, Coast Guard cutters and ocean-going cargo vessels. Up to the present time, there has been installed (or contracted for) in this country a total of seventy-two diesel-electric propulsion plants, ranging in size from 60 to 3200 shaft horsepower with a total shaft horsepower of 52,105. These figures indicate that electricity has quickly become an important factor in the field of ship propulsion, as it has in every other field of application when once introduced.



The main switchboard of the Steel Electrician.

Workboat Power

A new type Mianus diesel of 70 horsepower has been set up in the warerooms of the Chas. W. Dahl & Son Electric Company of San Francisco, northern California agents for this engine. The unit is one of the latest in design and embodies several special features. Ease of accessibility to all parts, great simplicity of design, and high-class mechanical construction have made the Mianus a very well liked unit by those who have installed them. The engine alluded to has also been fitted with a reverse operating clutch of the Joes type, beside being fully reversible as an engine. This has been done so that hoists and auxiliary machinery on the vessel can be operated by the main engines, a most desirable plan especially for fishing vessels.

In addition to the marine engines, the Mianus Company also build self-contained generating sets of from 4½ to 66 kilowatt capacity on the Leissner system, eliminating all separate air compressors, one cylinder of the engine being used as a compressor to charge reservoirs when needed. In all the marine units particular attention has been given to the use of corrosion resisting materials in their construction, which should insure a long life to the machines.

The United Ship Repair Company of San Francisco has an order from Dr. Evan Jones for a 48-foot auxiliary sloop for September delivery. The sloop is being built for speed, and will have a 35-45 Scripps engine.

New Ferries Successful

Southern Pacific Diesel-Electric Drives Demonstrate Reliability, Flexibility and Economy in Daily Service

THE recent trial followed by the placing in service of the new Southern Pacific ferryboats Fresno, Stockton, and Lake Tahoe, emphasize the advantages of diesel-electric drive for this type of vessel. The high efficiency of the diesel engine as a prime mover and the marked success of electric drive on other ferries on San Francisco Bay, led the Southern Pacific Company to adopt this type of propulsion for all six of its new ferries.

The diesel engine generators, with their switchboards, comprise a high efficiency floating central station, wherein power is generated for distribution to the various motor drives and auxiliaries aboard the ship. The principal users are the propulsion motors, which utilize the power delivered to them for driving the boat through the water. On account of the facility with which electric power can be delivered by wires and cables, the motors may be located at convenient places in the ship, thus allowing considerable freedom in the design of the vessel.

As in stationary power plants, the engines run continuously for long periods, thus obviating the necessity of large banks of starting air and the heavy and intricate reversing gear which would be a necessary part of the equipment if the diesel engines were required to start, stop, and reverse each time the vessel is maneuvered. While the engines are designed to run at a definite predetermined speed, they may be adjusted after installation to operate at slightly different speeds in order to insure running at their most effective point. The generators are then adjusted to compensate for this change, the motors run at such speed as to absorb full power, and the propeller doesn't know the difference.

On the Southern Pacific boats, which are double-ended, a separate double-armature motor is provided for each propeller. Each motor is rated 1250 horsepower at 130 revolutions per minute. The two motors are connected electrically in series with each other, and also in series with the main generators. In accelerating the vessel, full torque is applied to each propeller for a short period, after which the stern propeller comes up to its full speed and the bow propeller turns just enough to overcome its own resistance and friction. This action results in a high propulsion efficiency.

The power plant consists of four Nelseco diesel engines with a main and an auxiliary generator direct connected to each engine. The main generators are each rated 275 kilowatt, 230 revolutions per minute, 250 volts. The auxiliary generators are rated 40 kilowatts, 120 volts. The auxiliary generators provide power for excitation of the main generators and motors, and auxiliary power for the various pumps, compressors, steering gear, and other auxiliaries, as well as for lighting and cooking. By directly connecting the auxiliary generators to the main engines, advantage is taken of the low fuel consumption of the main engine and of the elimination of separate auxiliary engine sets. One stand-by generator is provided for use when the vessel is standing by and it is not desired to start the main engines.

The switchboard for controlling the output of the main generators is of the dead-front type; that is, the switches and all parts which are electrically alive are mounted back of the board but operated by handles, which are electrically dead, extending through to the front of the board. This provides maximum safety for the engineer and his assistants and prevents accidental contact with live circuits.

The design of the disconnecting switches is of a novel and ingenious nature. The main circuit switch blades are sectors of copper with teeth cut on the arc of the sector. These sectors mesh with textolite pinions mounted on the operating shaft connected to the handwheel on the front of the board, and, as the handwheel is rotated, the switch is thrown from one position to another. The textolite pinions, in addition to acting as an insulating medium between the live switch blades and the dead operating handwheel, also permit the operator to exert the maximum force exactly where he wishes it; namely, on the periphery of the switch blade.

The control arrangement provides for maneuvering the ship from three positions, one in the engine room and one in each pilot house. The pilot house controllers are similar in appearance to the conventional engine room telegraph pedestals and require no additional thought or judgment beyond that necessary for an engine room telegraph. In moving the handle the operator controls directly the output of power from the main generators to the motors instead of transmitting signals to the engine room for execution there. This method of control eliminates delay and prevents any possible misunderstanding of signals between the pilot house and engine room.

The various pumps and other auxiliaries are driven by motors, the ratings of some of which are:

Steering gear	20 h.p.,	775 r.p.m.
Fire pump	50 h.p.,	575 r.p.m.
Air compressors	8 h.p.,	1750 r.p.m.
Sanitary pump	8 h.p.,	1750 r.p.m.
General service pump	50 h.p.,	575 r.p.m.
Hot water pump	4 h.p.,	1750 r.p.m.
Fresh water pump	2¼ h.p.,	1750 r.p.m.
Circulating water pump	12 h.p.,	1150 r.p.m.
Fuel oil transfer pump	1⅛ h.p.,	1150 r.p.m.
Lubricating oil transfer pump	1⅛ h.p.,	1150 r.p.m.

All of the electrical equipment for four of the vessels was furnished by the General Electric Company. This includes not only the main propulsion machinery but also the various auxiliary motors and controls.

It is interesting to note that the diesel-electric type of propulsion is no longer considered as experimental for ferryboat operation, but is being recognized as the standard, modern type of drive. This is evidenced in this case by the fact that the Southern Pacific Company, one of the foremost agencies of transportation in this country, in contemplating the proper drive for its ferries, decided to install diesel engine electric propulsion not for one or two but for all six of their vessels.

We are informed that the fuel consumption on these new diesel electric vehicular ferries, as compared with the slightly smaller and somewhat slower steam vehicular ferries of the same general model, is averaging one ton for the diesel electric to about five tons for the steam drive.

New Diesel-Electric Tug

Ingersoll-Rand-Westinghouse Propulsion Machinery With Pilot House Control Demonstrates Great Flexibility and Efficiency In Towing Operation

The pilot house of the diesel-electric tug Meitowax.

THREADING its way through the cluttered traffic of New York Harbor, recently, an oil-electric tug, the latest development in maritime propulsion, went into service for the Long Island Railroad as a part of its harbor fleet. Throughout a day of rigorous tests she plied the waters of the harbors and two rivers, working with the alacrity and facility of operation characteristic of this new type of sea craft.

This oil-electric tug is the product of the Ingersoll-Rand Company, which makes the oil engines; the Westinghouse Electric Company, makers of the electric generators and motors; and the Staten Island Shipbuilding Company, at whose plant the hull was built.

The new tug is named the Meitowax, is 108 feet long over all, and 26 feet beam, with a moulded depth of 12 feet 3 inches. Her power plant consists of two Ingersoll-Rand "PR" 6-cylinder, 4-cycle, 13 by 19-inch oil engines, each direct-connected to a 230-kilowatt Westinghouse compound-wound generator and 25-kilowatt exciter. These oil engine generating sets are non- reversing and operate at a constant speed of 265 revolutions a minute. The generators are connected in series and normally supply 480-volt direct-current for the 565 shaft horsepower double armature, shunt-wound propulsion motor.

The Ingersoll-Rand oil engines each develops 340 brake horsepower at 265 revolutions per minute, operating on fuel oil. They are of the single-acting, four-cycle solid injection type. The fuel oil is sprayed into the center of the combustion chamber through two opposing nozzles. This results in complete atomization and thorough mixture with the air drawn from the atmosphere into the combustion chamber during the previous revolution. The simplicity and accuracy of this combustion principle, an exclusive feature of the Ingersoll-Rand oil engine, is shown by the unusually high economy and freedom from smoke.

The electrical equipment is designed especially for marine application. All the engine room auxiliaries are driven by motors. The power is supplied, through the various switchboard combinations, by power takeoffs from the exciters. A 6-horsepower Hill diesel engine, driving a 4-kilowatt, 120-volt, direct-current generator, supplies power and light for stand-by service. The auxiliary generating set is also connected through a clutch to an Ingersoll-Rand type 15, 4½-inch air compressor, which charges the air tank when no other power is available to start the main engines.

An Ingersoll-Rand Type 15 compressor, driven by a 5-horsepower motor, charges the main air tanks from which the main engines are started.

Two circulating water and bilge pumps, Northern rotary type, are driven by 5-horsepower motors. These units have capacities of 175 gallons per minute against 30 pounds pressure. A fuel transfer pump, Northern rotary type, is driven by a 2-horsepower motor. The steering motor (1½ horsepower, 115-volt) operates at 550 revolutions per minute. An American Radiator oil burning furnace is used for heating the pilot house, engine room, and crew quarters.

The pilot-house control of the oil-electric tug is worthy of special mention. The pilot is able to maneuver the craft far more easily than an automobile is controlled. The control is flexible as to speed variations and is positive to the highest degree. The tug can be completely turned around in its own length. When maneuvering, the captain keeps one hand on the steering wheel and the other on the control lever. With these, he can vary the speed of the propulsion motor from 0 to 130 revolutions per minute for ahead and astern movements. Due to the conservative rating of the power plant, reserve power is always available for emergency use.

The direction and speed of the double-armature propulsion motor are controlled by the voltage of the generators. A single lever controls both the direction of rotation and the speed of the propelling motor.

The Long Island Railroad's diesel-electric tug Meitowax

Malolo on Her Trials

Crack Matson Liner Demonstrates Her Ability and Seaworthiness Under Serious Emergency

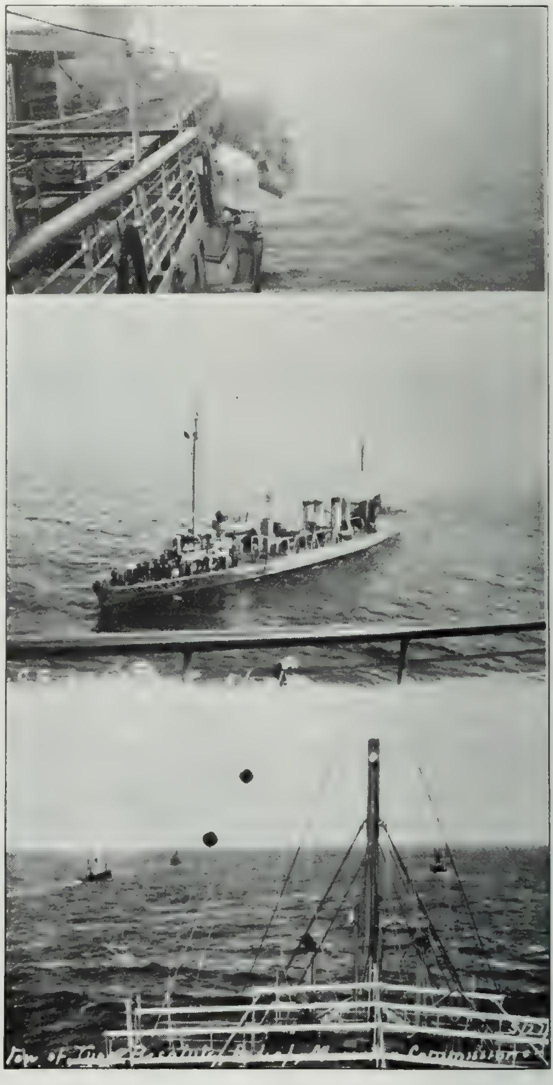
EARLY in the morning of Tuesday, May 24, the great passenger liner Malolo, largest and swiftest ever built in the United States, slipped down the Delaware River from the dock at Cramp's shipyard for a week of thorough testing at sea under various conditions. The Malolo, on account of the importance of the vessel and her possible use as an auxiliary cruiser in time of war, was to be given practically a Navy Standard trial, including runs at various speeds of the propeller over a measured mile course, a 48-hour endurance run at full speed, and various reversing and navigating tests. It was also intended that the vessel should be operated with every department in full swing.

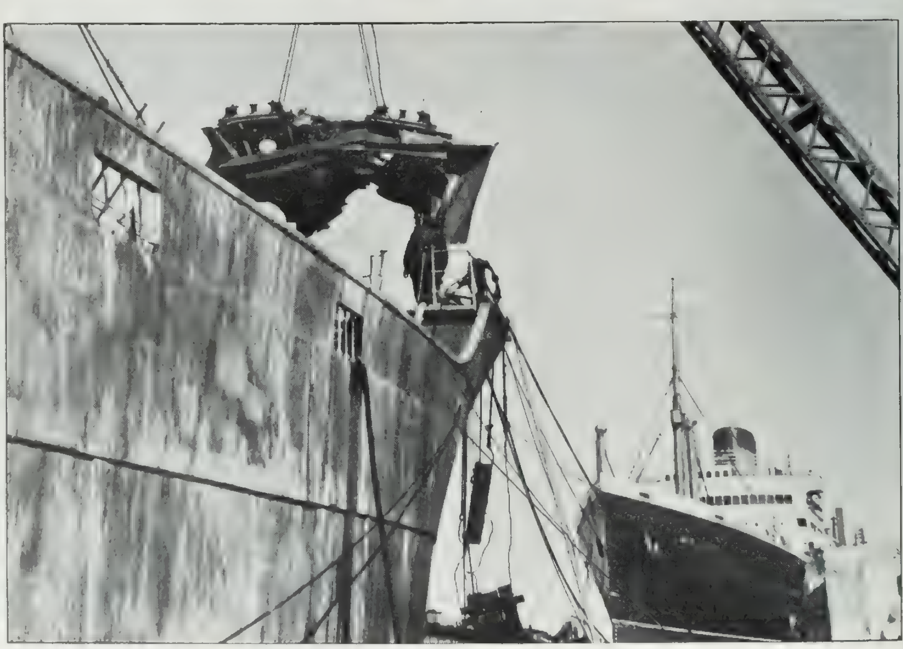
The vessel was under the command of Captain Tilton of the Wm. Cramp & Sons Ship & Engine Building Company, and the engine room was under command of Chief Engineer Tony Marple, also of Cramps. No guests had been invited for the trial run, but a number of prominent executives of the American-Hawaiian Steamship Co., of the Matson Navigation Co., and of Cramps' were on board, together with William Francis Gibbs, naval architect, and designer of the Malolo, and his brother, Frederick H. Gibbs, and their staff of engineers, draftsmen, and inspectors, who were divided into watches for the purpose of taking readings and tests of the various departments and operations of the ship. Among the executives mentioned above, William T. Roth, president; Wallace Alexander, member of the executive committee; Captain Saunders, operating manager; Captain Edwards, superintendent; Joseph Barker, superintending engineer; Captain Peter Johnson, commodore of the fleet and to command the Malolo; Captain C. A. Berndtson, to be executive officer of the Malolo, and Chief Engineer R. C. Dwyer, all represented the Matson Navigation Company. The American-Hawaiian Steamship Company was represented by Joseph D. Tomlinson, vice-president, and Mr. Hartridge, superintending engineer.

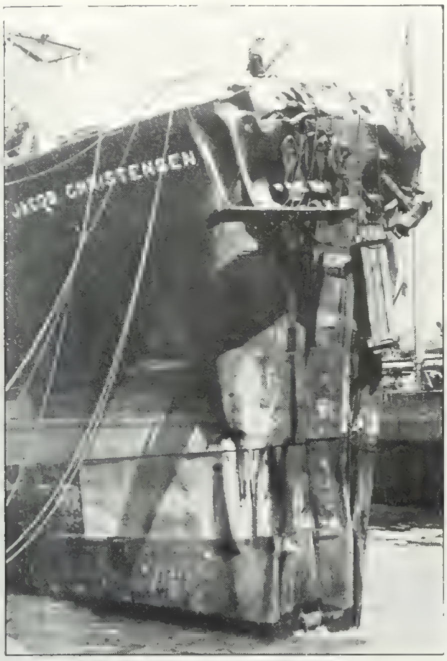
The Malolo, from the standpoint of the sailorman, was functioning 100 per cent during the first thirty

The shipping fraternity of the Pacific Coast was greatly shocked when the afternoon papers of May 24 came out with an "extra" describing the dangerous ramming of the Malolo during her trials. This vessel had been given so much newspaper publicity that her name was almost a household word and further news of her condition was anticipated with great eagerness. When it was learned that she was safe and was being towed to New York shipping men settled back with a sigh of relief to the hum-drum work-a-day grind.

On the right are shown three snaps taken aboard the Malolo just after the accident. The top shows boats out on the starboard side. The center shows the destroyer Shaw standing by. And the bottom shows the four tugs, arranged double tandem, towing the big ship toward New York. Below, we have a remarkable picture showing the two vessels in dry dock. A portion of the bow of the freighter having just been cut away with acetylene torches.





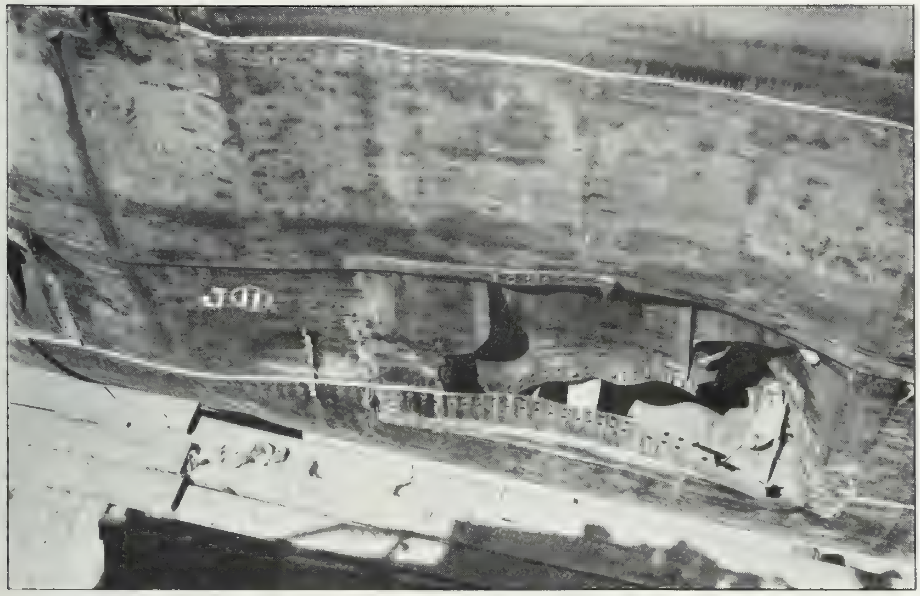


This is what happened to the nose of the Jacob Christensen.

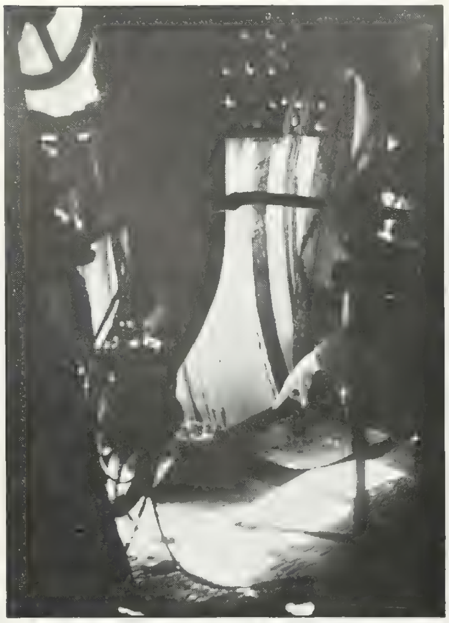
hours of her time at sea. The engines had been turned over up to 100 revolutions per minute of the propellers, a rate corresponding to approximately 20 knots speed. No vibration was experienced at this speed and the stability and facility of maneuvering of the ship was remarkable for a vessel of her size. Shortly after turning north to run up for the Navy Standard trial runs on the Maine coast, fairly heavy fog was experienced, and naturally the speed of the vessel was reduced. The radio, however, was functioning beautifully and radio bearings were readily obtainable.

At 2:45 p. m. Wednesday, the 25th of May, the Malolo was rammed full abeam by the Norwegian freighter Jacob Christensen in a dense fog and at a position nine miles off Nantucket lightship. The freighter, a vessel of 3560 tons net register, struck on the port side immediately forward of the bulkhead separating the two boiler rooms of the Malolo. As will be noted in the pictures used herewith, the bow of the freighter was smashed in and apparently this injured bow raked aft across the line of the bulkhead and a piece of the protruding stem forging ripped open a large hole just aft of the bulkhead and 15 feet below the water line.

The initial shock had opened two holes forward of the bulkhead. The raking aft opened one small hole and one large hole aft of the bulkhead. This large hole affected a patch 15 feet long and 10 feet high. Within five minutes after being struck, both boiler rooms were flooded. The fireroom force escaped aft through the water-tight door into the engine room, this door being immediately closed, but not until some water had gotten into the engine room. Just before the accident the draft forward was 26 feet. Within five minutes she had settled to a draft of 36 feet forward, with approximately a 2 per cent list to port. The injury to the side of the Malolo affects an area 40 feet long and 30 feet deep. With the settling of the ship, it was found that the laundry, barber shop, and beauty parlor located on the deck above the fire rooms were also flooded.



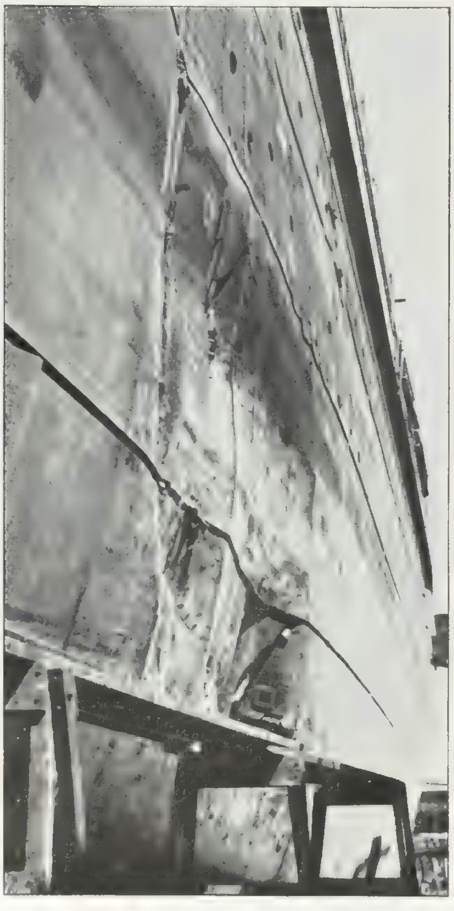
View looking down the side of the Malolo in dry dock showing the large hole opened into the after fire room.



A remarkable view looking through the hole in the Malolo's side. Note piece of the stem of the Jacob Christensen lying on the floor.

Immediately after the accident the radio broadcast the position of the Malolo and asked nearby ships to stand by. The Jacob Christensen reported that she was in no danger and offered to take the people off the Malolo. So far as navigation was concerned the Malolo was

(Continued on Page 348)



View looking aft along the side of the Malolo, showing buckling of plates and four punctures.

Biography of Lewis J. Spence

Executive Officer of Southern Pacific Company

LEWIS J. SPENCE was born and educated in the State of Delaware, and entered the service of the Southern Pacific Company in 1885 as stenographer in the office of Edwin Hawley, general eastern agent, whom he succeeded when Hawley relinquished that position to actively direct the destinies of railroad properties of which he had acquired financial control. Spence was subsequently offered the presidency of the Hawley railroads, when he was less than forty years of age, but decided to remain in the service of the Southern Pacific Company where he had already made phenomenal progress. After that property had become associated with the Union Pacific System he was called to Chicago to become Assistant Director of Traffic of the Union Pacific-Southern Pacific Systems, which were known as the Harriman Lines. He succeeded J. C. Stubbs as director of traffic of the combined system on January 1, 1912. His headquarters were transferred to New York and he became a director of all the companies embraced in the Union Pacific-Southern Pacific System. When the merger of these lines was dissolved by order of the Supreme Court of the United States in March, 1913, he was elected director of traffic of the Southern Pacific System and a member of the board of directors, with headquarters in New York.

Thereafter a leading financial journal of New York declared that the business-getting organization of the Southern Pacific System, which he headed, was not excelled in efficiency by any other in the country.

Upon the passage of the Panama Canal Act in 1921, prohibiting the ownership and operation of steamship lines by railroad companies except when authorized, after hearing, by the Interstate Commerce Commission, the responsibility devolved upon Mr. Spence of convincing the Interstate Commerce Commission that the continuance of steamship service by his company would be in the interest of the public, and of obtaining the support of this contention by the interested communities. The order of the commission authorizing continuance of the service contained the statement that "rarely does a record before us present an array of witnesses whose testimony so uniformly endorses the character of the service as does this record." A few years later he obtained a supplemental order from the commission authorizing an extension of this service to additional North Atlantic and Gulf ports.

When the transportation lines of the country were taken over by the government during the World War, Mr. Spence assumed administrative control of all the steamship lines operating on the Atlantic Coast, in response to a request of the director general of the United States Railroad Administration.

Before and after the period of federal control he was repeatedly chosen to represent all western lines before committees of the United States Senate and House of Representatives and was many times the witness of western lines before the Interstate Commerce Commission.

During the first four years after the return of the railroads to private management he was chairman of the Western Traffic Executive Committee, embracing all western railroads, and exerted a strong influence upon the restoration of normal traffic practices and public convenience.

After the Supreme Court had handed down a decision requiring the Southern Pacific Company to divest itself of the control of Central Pacific, an application was filed with the Interstate Commerce Commission under the Transportation Act for authority to own, lease, and operate the Central Pacific. In support of this application Mr. Spence appeared as the initial and principal witness and introduced comprehensive testimony not only with reference to the traffic features but all other aspects of the case, and had the unusual distinction of convincing the commission that the public interest would be promoted by the authorization of the control and operation which had been dissolved by the Supreme Court.

He subsequently conceived, prepared, and presented his company's case at hearings before the Interstate Commerce Commission looking to the formulation of a plan for the consolidation of the railroads of the country into a limited number of systems, under the provisions of the Transportation Act of 1920, and subsequently supported as a witness applications of his company for approval of the purchase and lease of properties in pursuance of that plan with invariable success.

That his many years' experience in the affairs of the system and his services in the executive management of the steamship lines of the company might be available by continuing his headquarters in New York, after the reorganization which followed the retirement of the late Mr. Kruttschnitt as chairman of the executive committee in 1925, Mr. Spence was elected executive officer of the Southern Pacific Compand and re-elected a member of the board of directors. Just as the gross revenue of the Southern Pacific Lines increased under his supervision of traffic from $139,367,000 in 1912 to $293,074,000 in 1925, it is understood that deficits of nearly $600,000 in 1924 and of more than $500,000 in 1925 were replaced by a net income of more than a million dollars from the operation of the steamship lines, under his administration thereof, in 1926.

Combined with a special study of the merger of railroads which was assigned to him by his company immediately after the enactment of the Transportation Act, the knowledge and experience acquired by him as an executive traffic officer has equipped him as a recognized authority on the practical questions involved in mergers and consolidations, and when the acquisition of common control of the Kansas City Southern, Missouri-Kansas-Texas, and St. Louis Southwestern Lines was recently before the Interstate Commerce Commission it devolved upon him to negotiate an agreement with these interests and support it as a witness before the commission, which would have the effect of preserving the existing through routes and channels of trade and commerce composed of the St. Louis Southwestern and Southern Pacific Lines in the event of the authorization of such common control.

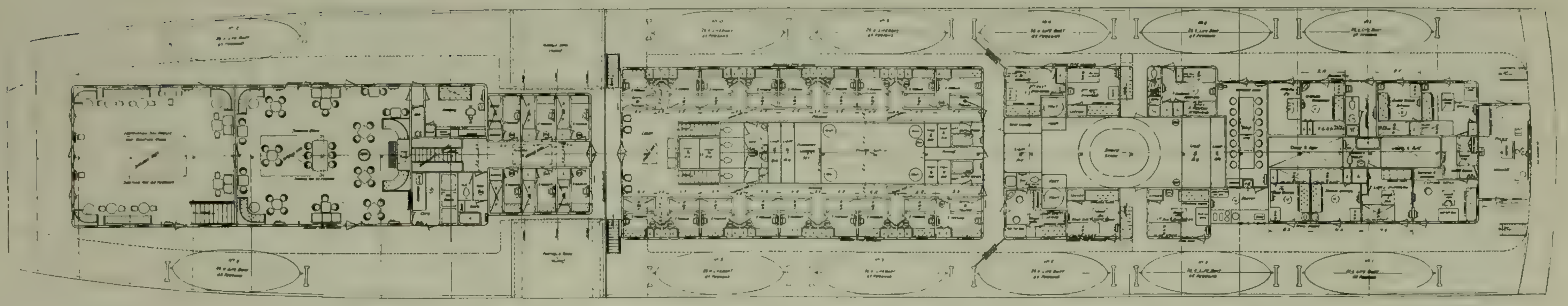
Mr. Spence is a director of two national banks and a member of the Bankers' Club, Lawyers' Club, Knickerbocker Field Club, Southward Ho Country Club, and Great South Bay Club. He has a winter home in New York and a summer home at Brightwaters, Long Island.

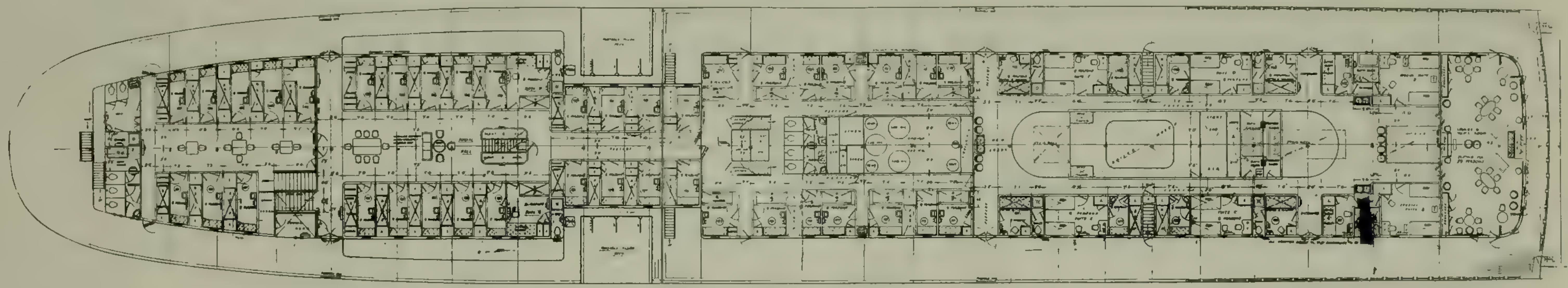
DECK ARRANGEMENT PLANS

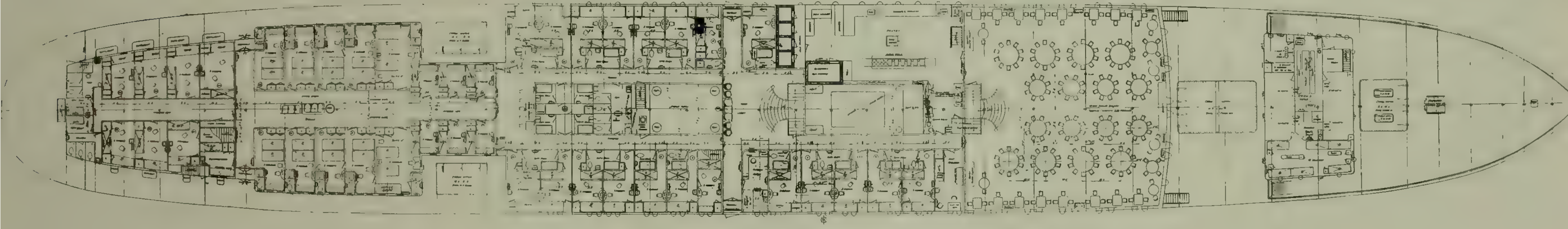
New Morgan Line

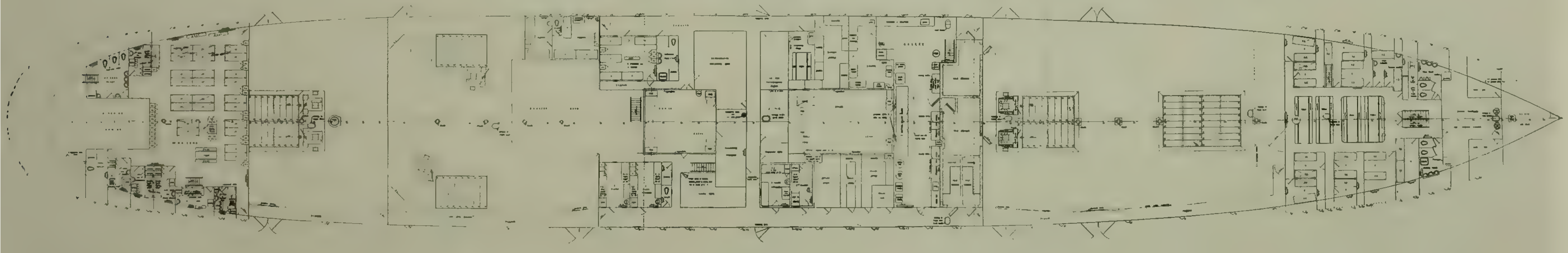
PASSENGER
AND
FREIGHT LINER

S. S. Dixie









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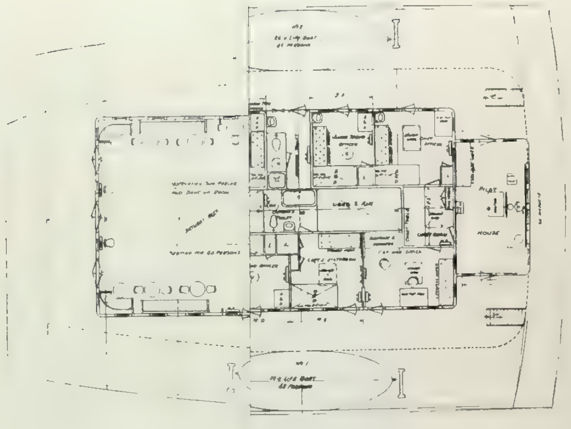
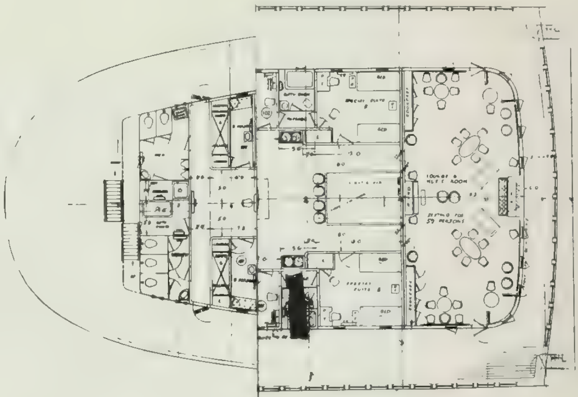
DECK ARRANGEMENT PLANS

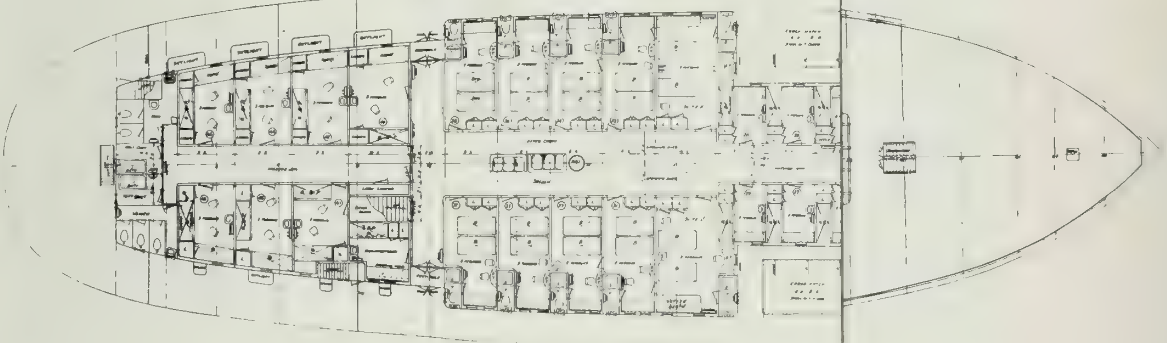
New Morgan Line

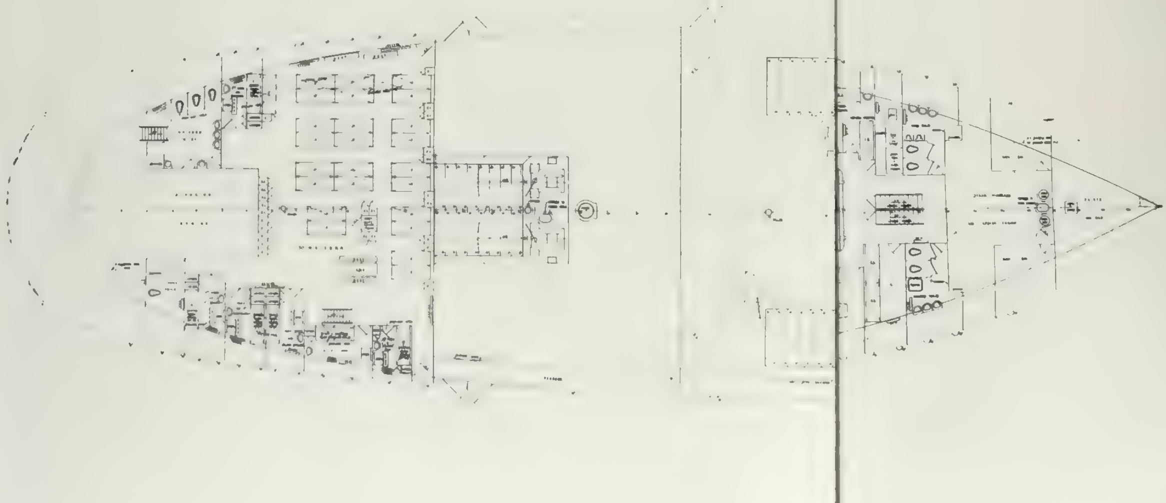
PASSENGER AND FREIGHT LINER

S. S. Dixie









New Morgan Line passenger and freight steamer Dixie

New Coastwise Liner

Federal Shipbuilding Company Building Fine Passenger and Freight Flyer for the Morgan Line Services of the Southern Pacific Company

THE new passenger and freight steamer of the Southern Pacific Steamship Lines which is rapidly approaching completion at the Federal Shipbuilding & Dry Dock Company, Kearny, New Jersey, will be launched August 1. The vessel was designed by A. S. Hebble, superintending engineer of the Southern Pacific Steamship Lines, who has been in immediate charge of its construction under the active direction of Lewis J. Spence, executive officer, who, with the advice of a distinguished naval architect and a professional interior decorator, has personally supervised the plans of construction and arrangement, and the decoration and furnishing of the vessel.

General Characteristics and Dimensions

Length over-all	445'0"
Length between perpendiculars	427'0"
Beam molded	60'0"
Depth molded to saloon deck	37'0"
Designed load draft	25'6"
Deadweight capacity, tons, about	6,900
Cubic capacity, about	420,000

The vessel will be of the most modern and up-to-date type for Atlantic Coastwise service. It will be capable of 16 knots. The main steering gear is of the hydro-electric type, with an auxiliary steam steering gear of the right and left hand screw type. Steering gears will be controlled by wire rope transmission from the pilot house, in addition to a Sperry gyro pilot control, fitted with a Sperry helm angle indicator. A Sperry gyro master compass with repeaters will also be fitted.

The vessel is of the hurricane deck type with steel superstructure with straight stem and semi-elliptical stern. She will be rigged with two pole masts and fitted with one smoke-stack. Three complete decks will extend fore and aft with an orlop deck in the forward hold to insure ample strength and stiffness. The promenade deck, approximately 8 feet wide, extends all around the superstructure. The passenger quarters will be located on the saloon, promenade, and boat decks. The division bulkheads around these accommodations will be of steel, and the deck over and deck below of steel, making them absolutely fireproof. The deck and engine officers' quarters, together with the messroom and wireless rooms, will be located on the boat deck around boiler casing on the forward end. The waiters and cooks will be located on the main deck aft and the firemen and oilers on the main deck amidships. The seamen are berthed in a deckhouse forward on the saloon deck.

The vessel will be built on the Isherwood system of longitudinal construction with scantlings equal to the requirements of the American Bureau of Shipping.

Fire Prevention and Detection

Particular attention has been given to fire-proofing the vessel and the passenger quarters in particular. Fire-proof Vehisote is used throughout for the divisions, ceilings, and panelings, and steel fire screen bulkheads are fitted throughout the accommodations and public rooms, with steel fire doors in the passageways. All staterooms are provided with a complete Atmo automatic fire alarm detector system. A Rich smoke detector system will be installed throughout the cargo space and in connection therewith the Lux fire extinguishing system will be fitted. The Lux system will also be fitted to the engine and boiler rooms and the oil fuel tanks. A manual alarm system will be fitted at various intervals throughout the passenger spaces. And in addition to this the cargo spaces will be fitted with a steam fire extinguishing system.

Life-Saving Equipment

The vessel will be equipped with the most modern life-saving and wireless equipment. Lifeboat capacity will be provided sufficient to take care of all persons on board, including passengers and crew. One of the lifeboats will be fitted as a motorboat.

Propelling Machinery

The propelling machinery for this vessel has been given careful consideration both with regard to economy and consistent operation with low maintenance costs. This machinery will consist of De Laval compound turbines with double reduction gears. The turbines are designed for 7100 normal shaft horsepower with 10 per cent maximum at 90 revolutions of the propeller shaft.

The boiler equipment will consist of four Babcock & Wilcox marine type water-tube boilers built for working pressure of 350 pounds per square inch and 200 degrees superheat and equipped to burn oil. The boilers are arranged fore and aft with a center athwartship fireroom and will be fitted with air heaters located at the base of the smoke stack. Both forced and induced draft will be fitted.

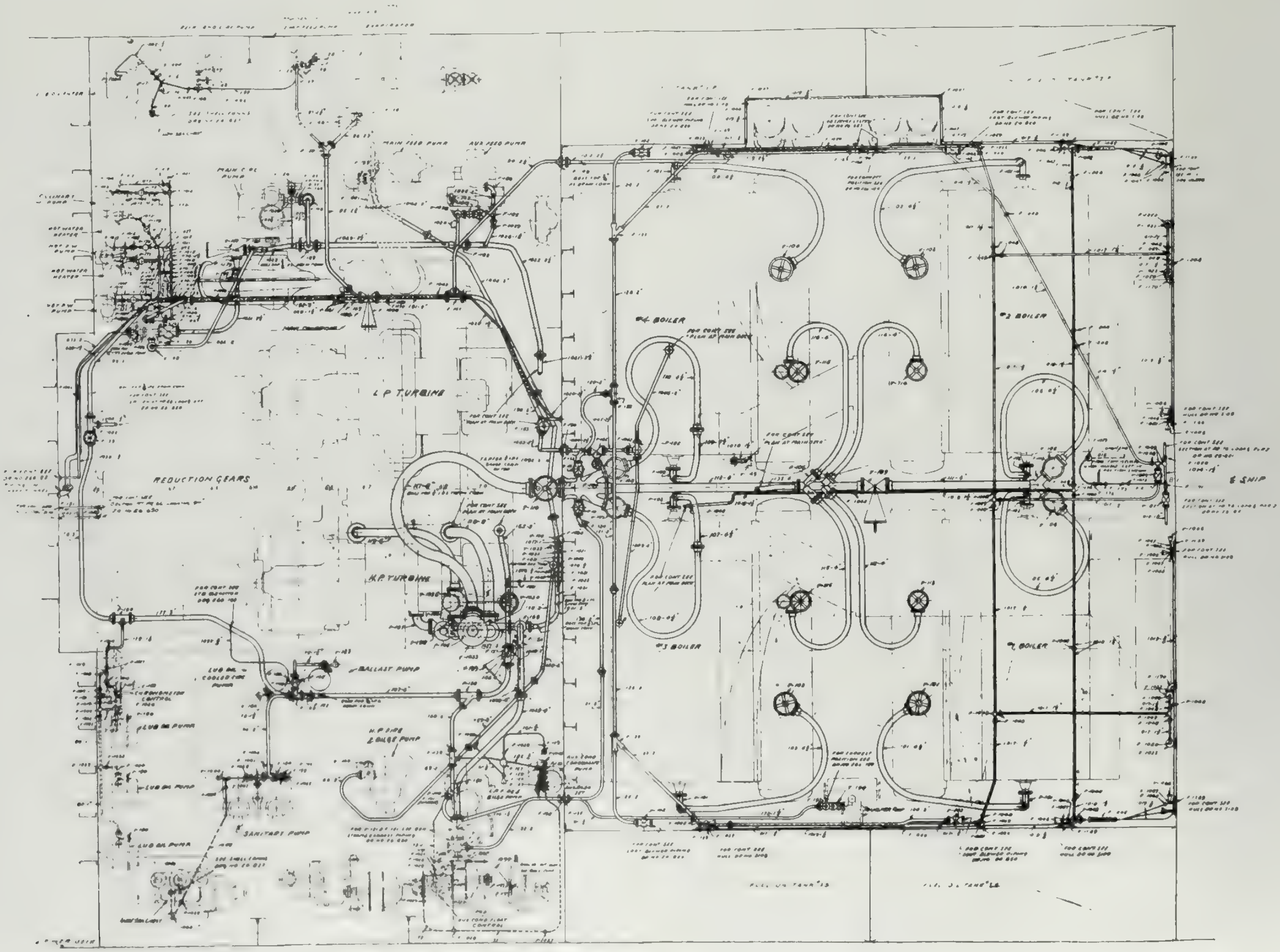
The turbines will consist of one high pressure ahead and one low pressure astern in series which will drive the high speed pinions in connection with the reduction gearing. The low pressure turbine will be arranged to exhaust through the bottom of the casing into the condenser. The condenser will be located below the low pressure turbine and will run athwart ship. The astern turbine in series will be arranged in the exhaust ends of both the ahead and astern turbines. The reversing turbine will develop two-thirds of full speed ahead power. The turbines are of the De Laval impulse type, specially designed to meet the requirements of marine service. The working parts are built to limit gauges and strictly interchangeable. Forged monel metal blading is fitted throughout.

The turbine will be designed to operate 330 pounds gauge pressure (350 boiler) and 200 degrees Fahrenheit superheat at high pressure ahead and astern nozzles. The revolutions at normal power will be 3250 and the revolutions of propeller at normal power 91 per minute. The unit will be capable of 7100 normal shaft horsepower with 10 per cent allowance for maximum. The turbines will be designed to operate as near maximum efficiency as possible at all powers above 50 per cent.

The high pressure casing is of cast steel and the low pressure casing of cast iron, both divided along the horizontal center line with the two halves bolted together. The steam chests for both the ahead and reversing elements are cast steel. Wheels are forged steel disc finished all over and designed to withstand speeds 75 per cent in excess of the normal operating speeds. The shafts are steel forgings tapering from the center, ground on all surfaces, and are to have a critical speed 75 per cent above normal running speed. Each turbine is fitted with a Kingsburg thrust in order to maintain the proper position of the rotor and to determine clearances of the turbines. The turbines are provided with a non-tripping speed governor, limiting the speed to a maximum of 10 per cent above normal. A complete arrangement of throttle valve control is fitted.

Double Reduction Gearing

The double reduction gear is arranged in three separate casings. The gearing is of the double helical type. The wheels of the first and second gears have cast iron centers and forged steel rims. Pinions of the first and second gears are nickel steel. The main thrust is of the Kingsbury type, of large diameter, fitted at the forward end of the low speed gear case and secured to the tank top. Flexible couplings are arranged between each turbine rotor shaft and pinion and between the first reduction gear wheel and the



General arrangement plan of engine and boiler rooms of the steamship Dixie.

second reduction pinions, to allow for axial and slight lateral movement. The line shaft is of steel with solid forged couplings. The thrust shaft is of steel with solid forged couplings and fitted with a composition sleeve. A torsion meter of the Denny-Edgecomb type is attached to the propeller shaft.

The turbine bearings, gear bearings, Kingsbury thrust, and gear teeth are lubricated from a gravity lubricating system. This system is maintained by three Simplex, double-acting, vertical pumps 8 inches by 10 inches by 12 inches, arranged so that two are working and one standing idle in case of emergency.

Water-Tube Boilers

The boilers are of the Babcock & Wilcox small tube marine water-tube type, built for working pressure of 350 lbs. per square inch and 225 degrees superheat at the superheater. They are equipped to burn oil. The oil burners are attached direct to boiler fronts. The boilers have a total evaporating surface of 21,180 square feet, and a total superheating surface of 2048 square feet. The pressure parts are constructed entirely of solid steel plates and seamless steel tubes. Each boiler is fitted with five Cuyama type oil burners. The burners, ash pan, and furnaces are suitably protected by fire-brick and non-conducting material. Each boiler is fitted with six Diamond soot blower units. Calorized units are fitted at the bottom of the first pass, protected by special alloy barriers. Each boiler is fitted with Babcock & Wilcox latest type feed water circulator, and each boiler is also fitted with a Bailey steam meter. A McNab simplex salt detector is fitted up complete in the engine room. The boilers will be arranged to operate under forced draft. The fans to consist of two 78-inch, three-stage bladed forced draft fans driven by an 8-inch x 7-inch balanced valve engine. A complete inducted draft apparatus is fitted in the stack above the air heaters and will consist of one No. 12 Sturtevant multivane single width, single inlet, Design No. 3 fan driven by Sturtevant A-8-G turbo-transmission.

There will be one main independent cylindrical condenser with wrought steel shell and cast steel forged ends, with 9500 square feet of cooling surface. The tubes and ferrules will be of solid drawn Admiralty mixture. Tubes are made water-tight in tube sheets by screwed glands packed with corset lacing. The condenser, together with the condensing equipment, is designed for maintaining 28½ inches of vacuum with sea water at 65 degrees Fahrenheit. The auxiliary condenser will be similar to the main condenser with steel shell and cast steel flanged ends and will have 1600 equare feet of cooling surface.

Radojet Ejector Fitted

The main condenser will be fitted with two 2-stage C. H. Wheeler Co. Radojet air ejector, fitted with inter-after condensers provided with automatic drain control. The auxiliary condenser will be fitted with one C. H. Wheeler Co. Radojet air ejector with after condenser provided with automatic drain control. The Radojets on the main condenser are independent and in duplicate. There will also be fitted in connection with the main condenser two vertical, turbo-driven condensate pumps arrange in duplicate.

There will be one centrifugal main feed pump, turbine driven, manufactured by the De Laval Steam Turbine Company, one auxiliary main feed pump, one high pressure fire, bilge, and boiler feed pump, one vertical duplex sanitary pump, one vertical single fresh water pump, two vertical single hot fresh water pumps, three vertical, single, lubricating oil pumps, one evaporator feed pump, one oil cooler circulating pump, two fuel oil pumps, duplex, one fuel oil transfer pump, duplex, all manufactured by the Warren Steam Pump Company.

The main circulating pump will be of the centrifugal type with a normal capacity of not less than 16,000 gallons per minute. The diameter of the suction at discharges will be 24 inches. The pump will be operated by a single cylinder engine. The impeller will be of brass and the shaft of Tobin bronze running in bronze bearings.

The generating sets consist of two 50 kilowatt and one 75-kilowatt geared turbine units, consisting of De Laval turbines and gears driving General Electric generators. These sets are designed to operate at a very low water rate.

Freight and Passenger Accommodations

The vessel will carry both freight and passengers. The passenger accommodations and public spaces throughout will be commodious, well ventilated, and of special design and arrangement.

The interior of the passenger quarters will be of American Colonial design. The public rooms will consist of a lounge and music room, spacious social halls, writing rooms, smoking room, a completely enclosed observation sun parlor and dance room, and a dining room, all handsomely decorated and furnished, and adjoining the smoking room on the boat deck will be a barber shop and a cafe. Accommodation will be provided for 279 first cabin passengers and 100 third cabin passengers. Every first cabin room is a well ventilated outside room, supplied with running hot and cold water and equipped with a full length mirror fitted into a wall panel. Of the regular staterooms equipped with a lower berth and an upper berth of the Pullman type, which can be closed when not in use, a number are provided with toilets and tiled shower baths. Some staterooms are furnished with twin beds, dressers, toilets, and tiled bathrooms with both tub and shower baths, hot and cold fresh and salt water being supplied to all baths. Some of the special rooms are arranged ensuite, with bedroom, bathroom, and sitting room, connecting and separate outside entrances to each of the rooms, the sitting room being equipped with a settee berth and washstand by which it can be converted into a bedroom when required. Cooled drinking water will be circulated throughout the passengers' and crew's quarters.

Public spaces, halls, and passageways will be heated by steam, and sleeping quarters by Electro-Vapour radiators. Electric fans will be provided in all staterooms and bathrooms. The observation sun parlor will have a dance floor 20 by 26 feet. The vessel will be provided with an electric piano and a combined radio receiving set and talking machine.

The forward end of the promenade deck will be built in solid and fitted with sliding glass windows extending aft on each side a distance of 75 feet. This deck will extend around the entire passenger quarters of the ship and will be broad enough to accommodate deck chairs and provide comfortable space for the usual exercises enjoyed at sea.

An inter-communicating telephone system will connect through a switchboard all suites and staterooms, public rooms, and social halls, as well as the offices of the captain, chief engineer, purser, and chief steward.

King and Queen of the Delta

California Transportation Company Adds Two Finest River Steamers In the World to its Fleet

One end of the social hall skylights featuring one of the imported French tapestries.

SINCE 1853 the California Transportation Company has carried freight and passengers up and down the Sacramento and San Joaquin Rivers between San Francisco, Stockton, and Sacramento. In the pioneer days of this service the great effort was to get the people and goods transported as rapidly as possible. The equipment, while primitive as judged from the standards of today, was nevertheless in some respects in the lead for its own time. The company was started by two men, Andrew Nelson and Nels Anderson, the latter being the father of Captain A. E. Anderson, now president and active executive manager of the company. Since its origin this concern has held the lead in river transportation on the Pacific Coast.

It is a matter of record that the stern-wheel river boat Capital City, built by the California Transportation Company in 1911, was the first vessel in the world to have hot and cold running water piped to every room. Reasons for this leadership in plumbing afloat are rather interesting. Early in the present century, Captain Anderson came to realize that in running his boats at night on a one-night run he was in competition with first-class hotels ashore. The boats are run on the so-called European hotel plan. Transportation, meals, rooms are all a separate charge. Demand called for room with bath, room with running water. Hence a necessary increase in plumbing. It is also a matter of record that the steamer Fort Sutter, built by this company shortly after the Capital City, was chosen by the United States Engineers in a survey of all vessels as the best type of river steamer in the United States.

The service had always been very popular with commercial men. Leaving San Francisco at 6:30 p. m. and arriving at Sacramento 6 a. m., after two good meals and a comfortable night's sleep, they were in good condition to meet prospects. More recently a big demand for space has come from auto parties during the long California touring season.

About four years ago the management, looking ahead, decided that they should build two larger and better first-class, self-propelled floating hotels for the Sacramento run. After much careful study and planning, these "hotels" were built and have recently been put into successful operation as the Delta King and Delta Queen. In several important points these vessels are radically in advance of anything yet seen on the rivers of America and it is therefore thought that a description would be of interest.

Hull Structure

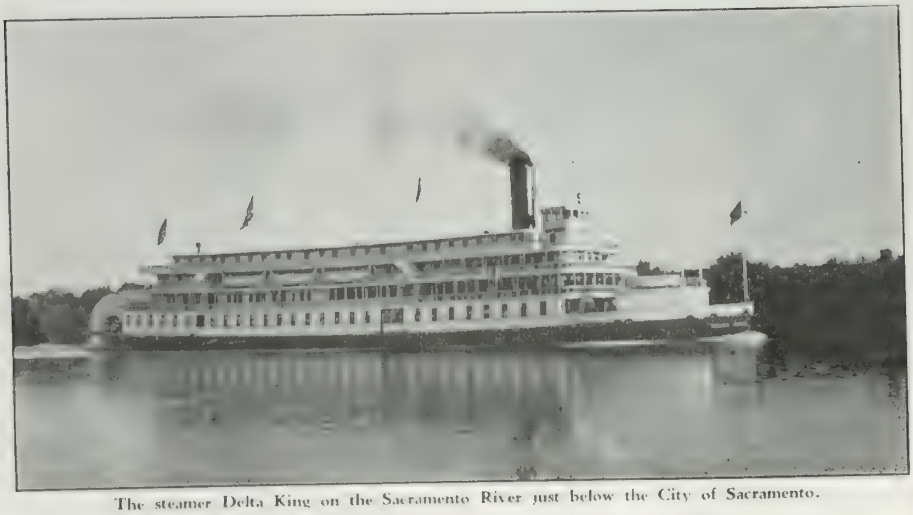
The hulls are built of special galvanized steel, fabricated and galvanized at the famous British shipyard of Denny Brothers, Dumbarton-on-Clyde. Lines for these hulls were tested in the tanks at Denny's and much thought was given to the design in order to get efficient sternwheel propulsion at small depths of water. The principal characteristics are:

Length	285'0"
Beam over deck	58'0"
Beam of hull	44'6"
Depth amidships	12'6"
Depth at fender	11'9"
Dead rise	6"

Mean draft, with coal and water aboard ready for cargo and passengers is 6 feet. A very heavy fender is provided composed of 5 inches of iron bark, and an outer steel plate ¾ inch thick bolted through to the steel hull.

Below the main deck the steel hull is divided into seven compartments by six water-tight steel bulkheads. These bulkheads have no door openings and wherever pipe or wiring has to be carried through, special precautions have been taken to make a sturdy water-tight fitting at the point pierced. Two skeleton steel stiffening trusses extend fore and aft throughout the structure below the main deck, tying into the thwartship bulkheads.

Beginning at the bow, the first hull compartment houses the chain locker and the engine for the Hyde vertical steam windlass and capstan supplied through C. V. Lane of San Francisco. Next aft comes the quarters for male passengers who want a comfortable but inexpensive bed. Here are 42 berths,



The steamer Delta King on the Sacramento River just below the City of Sacramento.

very nicely equipped and divided into seven rooms, with fine white tile lavatories and toilets fitted with the finest Crane plumbing. There is plenty of room and comfortable chairs and tables to play games, if desired. These berths are much in demand by workingmen and parties of hikers.

The entrance lobby on one of the new river boats.

The Boilers

In the next space aft are the boilers, two Foster water-tube marine boilers, each with 3080 square feet of heating surface and equipped with 450 square feet of superheated surface, giving about 50 degrees superheat. The boilers are fitted with four furnaces each, and on these furnaces we note one of the few differences between the Delta King and Delta Queen. The King's furnaces are equipped with Todd natural draft, mechanical oil burners, while those of the Queen are fitted with the burner manufactured by Staples and Pfeiffer of San Francisco.

The Todd oil burners, as well as Todd heating and pumping unit, were supplied by C. V. Lane, head of Ford & Geirrine of San Francisco. The engineers on the boats declare that the burners are O.K. and the superintendent says the company is burning less oil on the round trip than they had estimated would be necessary. Fuel oil tanks are mainly below the floors of the men's quarters forward of the boiler room. Storage is provided for 530 barrels. Pressure carried on boilers is 225 pounds per square inch. All boilers are equipped with Diamond soot blowers.

Aft of the boiler room is the compartment devoted to crew's quarters. Here are steel standee berths, two high, with fine wire spring mattress and heavy stuffed mattress. With plenty of light and air, nicely arranged lavatories, showers, and toilets, the men are made very comfortable.

The fifth compartment in order houses the galley and cold storage rooms, the dish washing equipment, the brine tanks for the refrigerating system, and two dining rooms for the crew. The galley has ample room and is equipped with plenty of utensils to take care of the hotel upstairs. A hydraulic elevator is installed to take care of supplies being brought in or taken out, and there is adequate dumb-waiter quate dumb-waiter service to the pantry above. The famous Ingle oil-burning range is used.

Machinery

Next aft is a space devoted to machinery, entrance to which is made at its after end from a position on the main deck, which is practically the center of the engine room. In this compartment are the condensers, the circulating pumps, the air pumps, the hot well, the brine circulating pumps, the Westinghouse turbo-generating sets, the 7½-ton capacity York refrigerating machinery, the storage for hot and cold water, and the heaters. In the refrigerating system carbon dioxide from the compressor is lead only to the brine tanks and to the cold drinking water storage. Cold brine is used for all other cooling purposes. This compartment houses also the ventilating blower of 20,000 cubic feet a minute capacity and the arrangements for heating or washing the air used.

The last compartment at the stern houses the tillers. There are four rudders, hung in line under the counter. The rudder stock is brought through a fitting in the counter and carried up through a

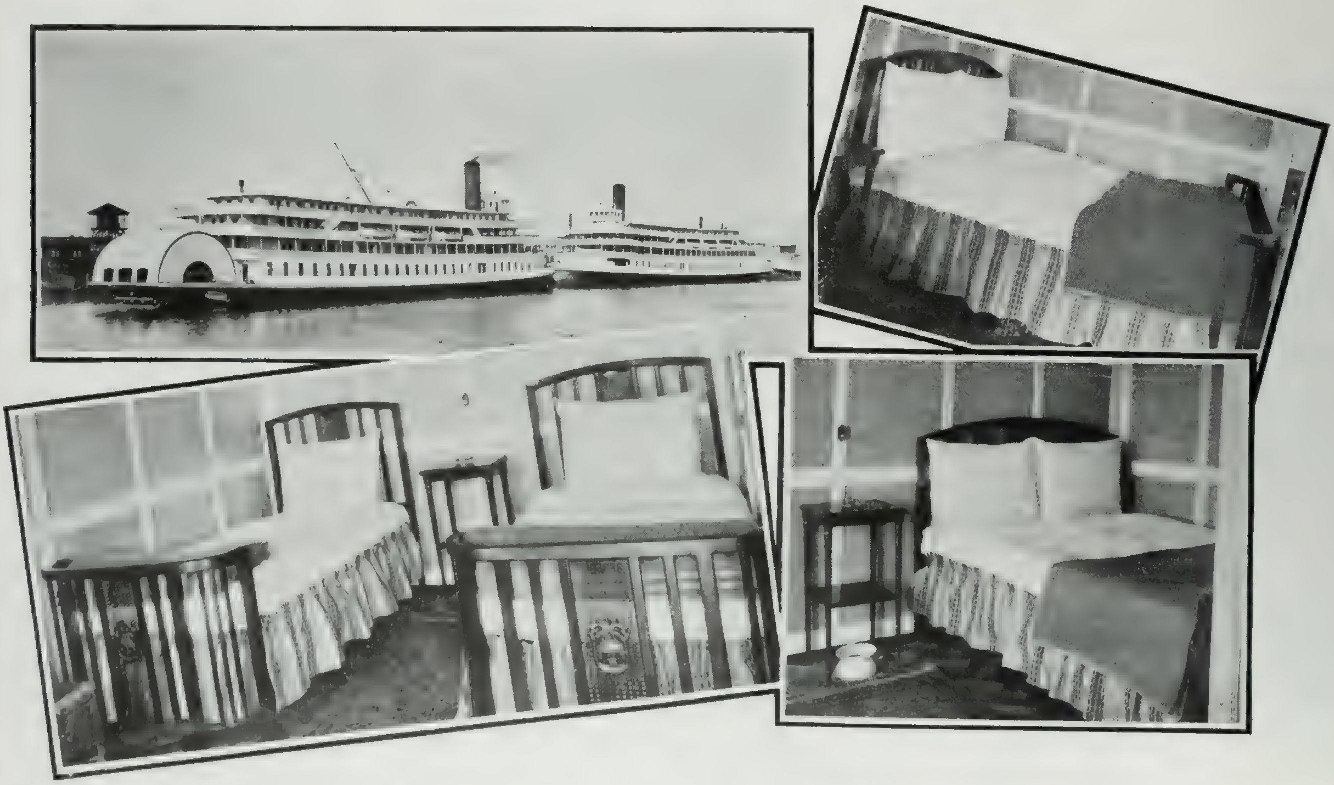
Delta Queen and Delta King at the Stockton yard of the California Transportation Company a few days before they were put into service.

Portion of the dining room on the Delta King.

flanged bushing in the main deck, where a locked nut, a steel washer, and a bronze washer provide a thrust bearing to take the weight. Tillers are keyed onto each of these rudder stocks and on the center line of the ship a long pivoted lever is arranged, so that at its forward end it works in a trunnion slide on a thwartship guide bar. The lever is connected to each of the adjacent tillers by a steel bar pivoted on each end. The trunnion slide block is connected by wire rope over sheaves to the Evans steam steering engine located in the forward end of the boiler room directly under the pilot house. Duplicate wire rope leads are installed, one to the drum of the steering engine, one to the large steering wheel in pilot house for emergency steering. A clutch driving the drum of the steering engine is hydraulically actuated from the pilot house, so that the navigating officer on the bridge can instantly throw over from power to hand steering. The large handwheel is connected to the tillers constantly and its movements form a visible check on the functioning of the rudders. A large bronze arrowheaded pointer mounted at the back of this wheel and geared to its shaft is the Cory mechanical helm angle indicator. For operating the steering engine control valve there are two levers joined together with a bar so that the vessel may be steered from either side of the pilot house. Two compasses and two Cory engine room telegraphs complete this duplicate control.

On the main deck above the tiller room is the main engine room. As will be noted in the illustration, there is ample clear space in this room. The engines were built and installed by C. H. Evans & Company of San Francisco, who have built this type of engine with great success and constant improvement for many years. These engines, as installed in the Delta King and Delta Queen, are perhaps the largest of their type afloat. Dimensions are: high pressure cylinder, 26 inches diameter; low pressure cylinder, 52 inches diameter; stroke, 10 feet. The rods are 6½ inches diameter and the built-up pitmans weigh 8600 pounds each without the brasses. The shaft of the paddle wheel is 17 inches in diameter and is forged hollow, with an 8-inch hole. The paddle wheel is 26 feet 4 inches diameter over buckets and a shade under 20 feet wide.

Both cylinders of the engine are fitted with poppet valves, and both have cut-off control. A steam reversing engine gives power control of the links on the eccentric rods and there is also fitted a hand lever control of this feature. At 16 turns these engines figure 1500 developed horsepower and the big paddle wheel figures approximately 15 miles an hour peripheral speed. These steamers have never been run on the measured mile. They have ample speed to make their schedule at practically any



Views of several different staterooms on board the new river boats of the California Transportation Company showing The Simmons Company beds. These are hand-grained and finished to match the genuine teakwood furnishings of the luxurious staterooms.

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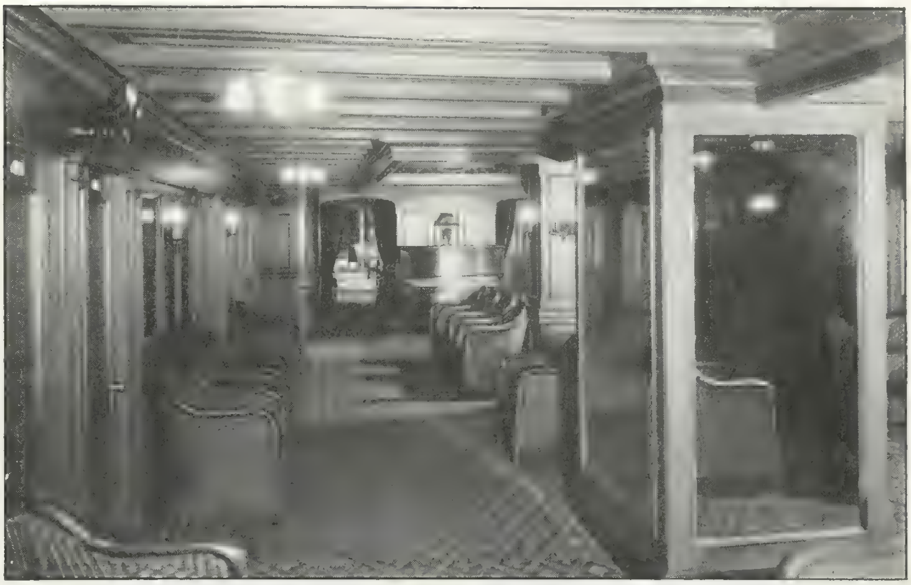
condition of tide or wind, and they do it by speeding up in deep water and slowing down in shallow spots.

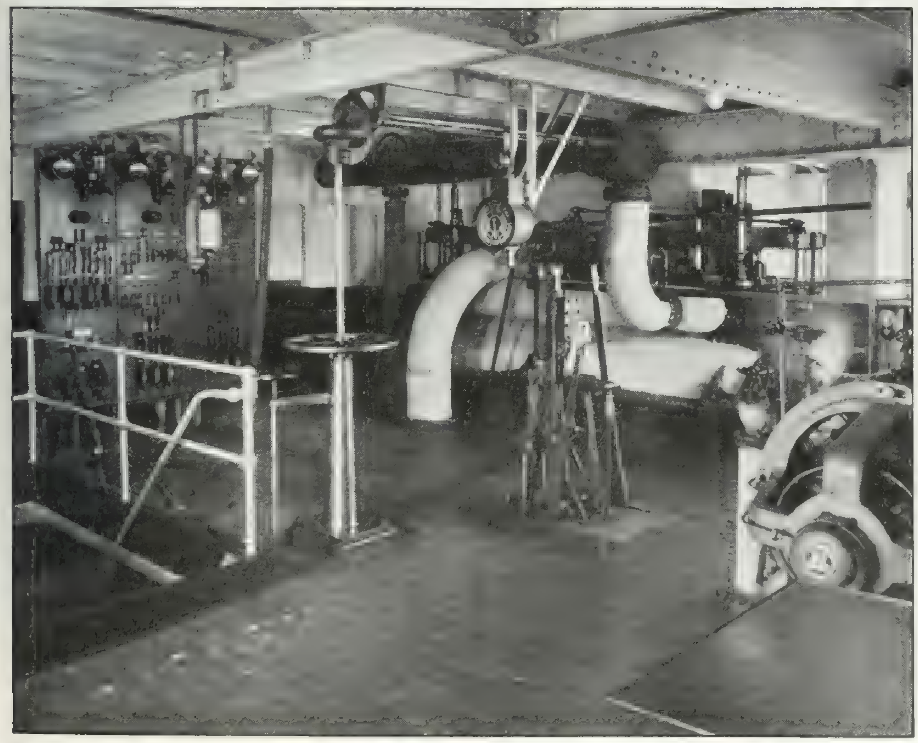
Forward of the engine room on the main deck the space is devoted largely to freight and automobiles. Forty automobiles can be carried on the enclosed main deck, and 15 extra on the outside decks. From 350 to 400 tons of additional freight can be carried. The steel structure is carried up to the deck above the main deck, and the fore and aft members under that deck are very heavy girders connected into the lower hull structure so as to make for great longitudinal strength without making the hulls too stiff.

Passenger Accommodations



One end of the social hall of the Delta King looking forward into dining room.

Coming now to the passenger accommodations of the first class floating hotel, which has a capacity of 468 patrons, we find everywhere here, as below, the evidence of much forethought in planning for efficient service and maximum comfort and convenience. The main passenger entrance opens into a spacious lobby and to a regular hotel desk, where the purser makes all necessary arrangements for your comfort. This room (and every public room on these ships) is paneled in oak with mahogany trim. A handsome staircase leads to the deck above and wide double passageways lead to observation room forward and to the dining room aft of the lobby. Still further aft is the social hall and away aft is the smoking room. In the observation room, which has plate-glass windows around three sides, the deck is richly carpeted and the furniture is in wicker with soft morocco leather trim and cushions. The dining room, lobby, passageways, and smoking room floors are covered with Goodrich sheet rubber flooring in marbleized tile effect. Some 8000 square feet of this material was installed on these ships through the agency of Ford & Geirrine, C. V. Lane in charge. Heavy mahogany dinner chairs with seats upholstered in soft brown morocco leather combine with the stately old English oak paneling to give the dining room a rather stately dignity which is made charming by flooding the room with daylight through large plate-glass windows, port and starboard, and mirrors on the bulkheads. In the lobby and social hall are many wonderfully comfortable over-stuffed chairs in all-leather. Two prominent and beautiful features of the social hall are the two circular skylights in colored glass. In the panel at each end of each skylight is mounted an imported tapestry panel. The drapes, upholstery, and tapestries are all the personal selection of Captain Anderson, president of the California Transportation Company, and were largely furnished by Bernhard's, Incorporated, of San Francisco.



Starboard side of engine room showing high pressure cylinder and valve gear, engine room telegraph, steam reverse gear, and throttle valve gear.

In the staterooms it would be rather difficult to imagine anything more complete or more comfortable than those on these superb river liners. Every room has running hot and cold water. There are 28 private or communicating baths. The public lavatories are equal to those of the very finest hotels. Plumbing is all highest quality Crane equipment. Every room has ample electric light, controlled by trip wall switch, annunciator call button, and a wall plug alongside mirror over the wash basin for curling iron or other use. Every room has a louver for the fresh air blower system. A Sturtevant 20,000 cubic feet per minute capacity fan forces this air to every compartment and each room on the ship. The air can be warmed or it can be cooled by washing in either fresh or salt cold water. Lying at Sacramento on hot days the staterooms are flooded with fresh water washed, cool air all afternoon. Sixty-eight of the staterooms are arranged in suites of two and three rooms.

The beds were supplied by the Simmons Company, and a passenger can get a large choice in sleeping conditions. Single beds, twin beds, double beds, standee berths—you pay your money and take your choice. But no matter which you choose you will get clean, comfortable, uninterrupted repose and sleep so far as the housekeeping of the Delta King and the Delta Queen have any influence on your body and brain.

All staterooms are finished in white or ivory trim with light tan Nevasplit paneling.

The Western Asbestos Magnesia Company supplied all sound deadening and insulating board for the ceilings of passenger quarters, and also furnished and installed the insulation for the ice water lines, steam piping, etc. The plumbing fixtures are in Crane white porcelain with heavy nickel-plated fittings and bevel plate glass mirrors. The electrical fixtures, switch plates, annunciator buttons are attractively modeled bronze with a touch of color in the relief work of the molding and in the lamp shades. Floors in the staterooms are covered with inlaid linoleum and with fine Wilton rugs. Beds and furniture are largely of metal in teakwood finish.

Life preservers are of course provided for all passengers and crew. Eight Welin metallic lifeboats are provided on each vessel. Six of these are 20-foot boats with a capacity of 19 persons each. Two are 16-foot boats with a capacity of 12 persons each. These boats are all handled by Welin patent davits. The six larger boats are located three port and three starboard admidships. The other two are on top of the forward cargo house. This lifeboat equipment was also supplied through the agency of C. V. Lane. Best of all safety provisions are the safety qualities in the hull and machinery already noted in this article. There is ample installation of fire hose and fire main outlet to easily reach all parts of the ship with two streams or more. Fire fighting tools and portable chemical extinguishers are provided in plenty.

Another element of safety is the careful preservation of the metal surfaces. Although the steel hulls of these vessels are heavily galvanized in a way that practically impregnates the steel with zinc, nevertheless, they were carefully painted inside and out with two coats of L. S. Portland Cement paint and under the water line copper paint was applied in a third coat. L. S. Portland Cement paint is manufactured by Hill, Hubbell & Co., and was supplied by C. V. Lane of Ford & Geirrine, San Francisco.

These two fine boats were built at the shipyard of the California Transportation Company at Stockton, California. While the plans for the vessels were being drawn up, it was found necessary to materially increase the facilities at the company's shipyard. The new equipment and improvements included the construction of a new wharf, the installation of a 25-ton crane, a traveling crane, enlarged ways for the boats. In addition to this a new planing mill was built and a large amount of new and up-to-date machinery was installed to equip this yard for the work of building these two large river steamers.

In short, this king and queen line up to the names. They are regal in their appointments, in their outward appearance, and in their inner quality. In these days of rush and roar and jumping on the band wagon to share in every piece of publicity that comes along, it is refreshing to find occasionally an executive and an organization that attend strictly to their own business and make a success of it. From the stem to the end of the paddle guard, Delta King and Delta Queen show intelligent design and capable execution in a thoroughly finished job.

Our hats are off to Captain A. E. Anderson and the organization which he directs. We salute them for a good job well done.

Anton Flettner on the Rotor

One of the most interesting marine books published in America in recent months is Willhofft's translation from the German of "Mein Wig zum Rotor" by Anton Flettner, published by F. O. Willhofft, 68 Beaver street, New York.

Anton Flettner's inventions have received such wide publicity, and are so spectacular in their operation that many readers will be glad to follow this frank, straight-forward, simple account of their development and application, particularly as much of the publicity was and still is distorted and false. This misinformation was much deplored by Flettner, himself. In the introduction he alludes to it as follows:

"In the autumn of 1924 the general public too was very thoroughly informed about my invention of the ship's rotor by the daily press; this publicity started an extremely lively general discussion, extending far beyond the German boundaries so that very soon the general and technical literature on the subject grew to an extent such as had hardly ever been paralleled, at least not in so short a time. In itself this intense interest with which my inventions were everywhere received, was certainly most gratifying; technically, however, this publicity had a great disadvantage. Misinformation and truth, reality and imagination, were all jumbled together. The idea of the practical application of the rotor and the various economic possibilities suggested thereby were associated with combinations which—frequently without my knowledge, and without sufficient technical knowledge on the part of the authors—gave a completely distorted picture of my views and of my inventions.

Engineers and shipping men fully realized that an invention such as that of the rotorship, as revolutionary and novel as it might prove to be for the world's shipping, could not over night be put into practice on a large scale. Such an undertaking requires time, systematic precision, and—most of all—no undue haste. Dreams for the future, and technical predictions such as were indulged in by part of the press in connection with my invention may possibly come true some day, but not as quickly as some people assumed.

The fact that the idea of my invention had received such wide publicity, suggested to me that, quite distinct from the engineering literature, I might present in simple language, nontechnical as far as possible, the story of the inception and the evolution of my work and of my plans. This little book, therefore, has the following purpose; to enable the nontechnical reader, the layman, to secure a plastic picture of the origin, value, scope, and future possibilities of my inventions.

Pacific Workboats and Their Power Plants

With the Boat and Engine Builders

Anderson & Cristofani, near Hunter's Point, San Francisco, have built a 43-foot fishing boat for Monterey owners which will be fitted with a late model Standard gas engine of 40 horsepower. The same firm have lately completed a twin screw workboat for Captain Lorentzen of San Francisco, which will have installed two Atlas-Imperial diesels of 65 horsepower each. This will give the craft, which is very solidly built, the good power and maneuvering qualities so essential to the business of handling heavy tows.

Bruer & Siemer, at South San Francisco, keep busy on general repairs to barges and scow schooners which are always needing overhauling, owing to the heavy and wearing work in which they are engaged. The three ways at this yard are nearly always occupied, the work being quite steady.

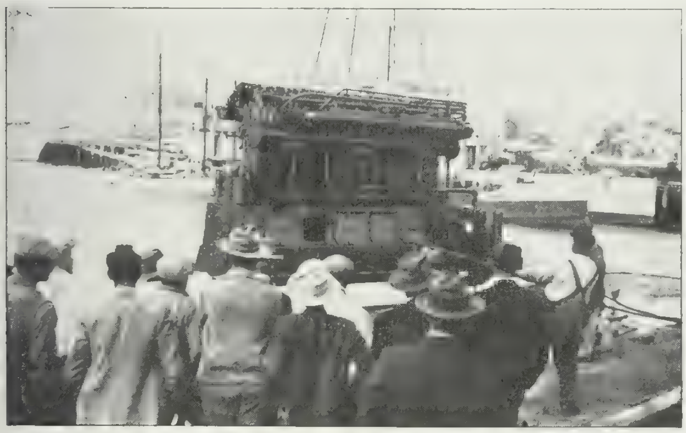
David Austin, grandson of "Pop" Anderson, San Francisco shipbuilder. This youngster is the youngest of the expert force at Anderson and Cristofani's yard.

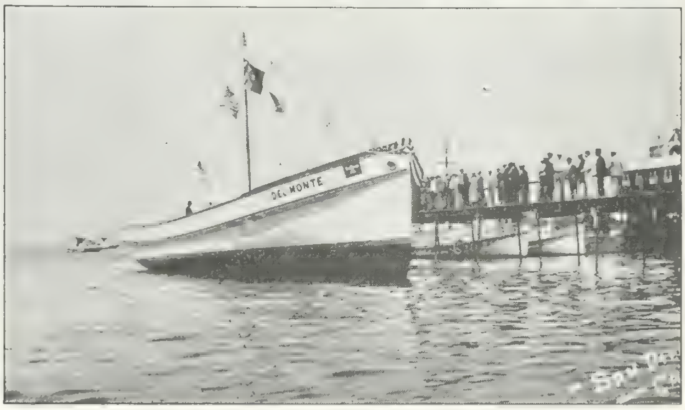
The latest reports received by Lester Stone of **W. F. Stone & Son,** of Oakland, builder of John Borden's exploring yacht Northern Light, were from way up north on the Alaska Coast. Everything was in first-class order, there having been no trouble whatever with any part of the vessel, either in her equipment or motive power. Mr. Stone has reason to feel satisfied with a record like this as it shows that good work was done on the craft.

Work on the new tugs for the Crowley Launch & Tugboat Co., San Francisco, is progressing rapidly at Stone's yard. These craft will be of the heavy seagoing type, powered by Pacific Werkspoor diesel engines.

The Los Angeles Shipbuilding & Drydock Corporation has started a workboat building department, and their first hull launched was powered with an Atlas-Imperial diesel. The second job, now building, is for Captain Peter Dragich, to be used as a fishing vessel. She is 74 feet length, 19 feet beam, and 7 feet draft. She will be powered with a 6-cylinder, 150-horsepower Union diesel, which will give her a fine power flexibility for speed and towing. These hulls for smaller craft are as carefully attended to in construction by the builders as were the big ten thousand tonners for which the Los Angeles Shipbuilding & Drydock Corporation is famous. In addition to building new hulls, the department will attend to repairs and overhauling of the workboat fleet, of which there are thousands of units operating in southern California waters.

Standard Gas Engine Works at Oakland, California, have been very busy lately filling orders for this old and well-known motor. Among recent shipments were two sets of





THE DEL MONTE

Views of the new fishing workboat Del Monte, built by the Campbell Machine Works of San Diego, show this craft on the ways, after launching, and her big Union fully reversible diesel engines of 225 horsepower, being lowered into place. This vessel is 88 feet long by 22 feet beam, and 7 feet draft. She has an exceptionally strongly built hull and will be a fine addition to the fast growing San Diego fishing fleet. The 6-cylinder Union diesel will give her easily a twelve mile speed and power in plenty to carry her through all weather.

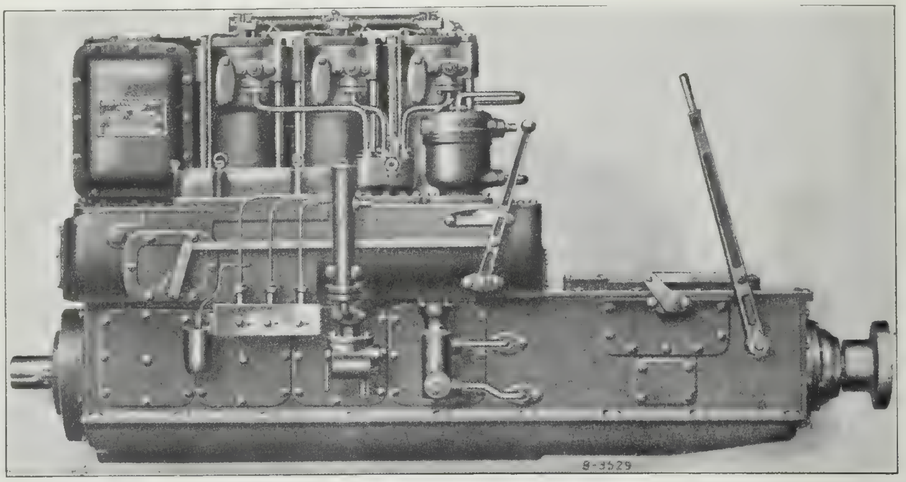
3-cylinder, 40-horsepower engines and one 30-horsepower marine engine for installation in a British Honduras workboat. Two more of 65 and 80 horsepower are to follow the others soon. In addition to the foreign shipments mentioned, Standard has shipped several units of various powers to North and South Pacific Coast and to Hawaiian owners. A 40-horsepower Standard engine has recently been installed in the New Moon, a fishing craft of Monterey, for Captain S. Russo. The Standard shops have recently given a thorough overhaul, and the first one, by the way, to an engine built by them nineteen years ago for service in Alaska. Later this engine was sent south, the hull it was in having worn out. It will now be put into a workboat at Rio Vista, California.

Wm. Cryer & Son, Oakland, have recently been doing considerable repair work for the Harbor Tug and Barge Co. Besides this, the yard has under construction a sturdy seagoing cruiser for E. R. Burris of Oakland. This comfortable family boat will be 65 feet length, 16 feet beam, and 7 feet depth. She will be fitted with an Atlas-Imperial 3-cylinder, 75-horsepower diesel engine of the latest type. Fuel tanks of 500 gallons capacity will insure wide cruising radius. All material and work will be of the highest order. The new craft will be used by the owner for trips along the Coast.

The Atlas-Imperial Engine Company at Oakland have shipped some thirty units of their diesel engines to different ports of the world during the past few weeks. Among them were two sets of 175-horsepower, 6-cylinder engines for Cuba, where Ralph S. Lorimer of the company has gone to attend to the installation. These units will be followed at an early date by three more sets of the same type.

A 100-horsepower diesel has been placed in the new workboat built by **John Twigg & Son,** San Francisco, for W. R. Grace and Co., which will be used in a South American West Coast port.

In addition to these jobs shipments have been made to Alaska, Honolulu, Seattle, Los Angeles, Portland, and other Pacific Coast ports, Australia, East Indies, and China.



The Worthington 2-cycle solid injection, 3-cylinder, marine type diesel engine with built-in reverse gear.

The Worthington Marine Diesel Engine

THE Ayres-Whitside workboat operators of the Delta district, California, have ordered two Worthington diesel engines which will replace two gas engines in their vessel the Drake. The Worthington engine was selected after careful analysis of the factors involved, and is, by the way, the first installation of this make in San Francisco Bay waters.

The Worthington diesel is of the 2-cycle solid injection type, with low starting air, and is a good type of prime mover for workboat operation. It is claimed by the builders that it has far fewer parts, and that certain features incorporated permit of very flexible handling, it being possible to idle down to as low as 90 revolutions per minute for long periods. All parts are carefully balanced, in addition to the exact mechanical workmanship, always a Worthington qualification.

Extra large wrist and crank pins are lubricated by positive forced feed, all cam and other shafts also being drilled for this purpose. High grade material is used throughout, and in many cases exceeds that demanded by American Bureau of Shipping. The scavenging air pump is designed for a ratio of 1.5 to 1. Scavenging air is taken from the intake manifold and discharged di-

The tug Louie Black, shown herewith, is the latest product in diesel tugs from the yard of William Muller, Wilmington, California. She is 86 feet 6 inches long, with a beam of 24 feet and draft of 10 feet 6 inches. Her power plant is completely Winton. The main engine is a Model-121, 400 brake horsepower, 250 revolutions per minute full diesel. There are two Winton gasoline engine auxiliary generating sets and two Winton motor driven air compressors, and a Winton fire and bilge pump.

rect to the cylinder manifolds, thus insuring pure air.

This Worthington diesel in the small sizes is as carefully made as the heavier units and should give long and satisfactory service. That this type of engine is meeting with favor by workboat operators on the Coast is evident, as several installations have lately been made in the Northwest, among them a 50-horsepower engine for A. T. Horrocks of Seattle; a 120-horsepower full reversible engine for the Wagner Tow Boat Company of the same port, and a 4-cylinder 80-horsepower unit for James K. Brown of Ketchikan, Alaska, which drives their boat Sunlight a good 10 knots at a very low fuel consumption.

The work of refitting the Drake is being done at the yard of Laurentzen & Bundesen, Pittsburg, and Pacific Marine Review will later publish description of the power plant and the vessel, together with performance results.

Hicks Marine Gas Engine

The erecting floor of the Hicks Gas Engine Department of the Yuba Manufacturing Company.

THE Hicks Engine Works of San Francisco has been absorbed by the Yuba Manufacturing Company, and modern methods of manufacture are now being employed in the production of this well-known type of gas engine. About a year ago the engineering and production staffs of the Yuba Manufacturing Company were directed to develop an economical line-up at their Benicia plant for the building of the Hicks engine, and at the same time to make such improvements on the engine design as experience and good engineering practice would suggest.

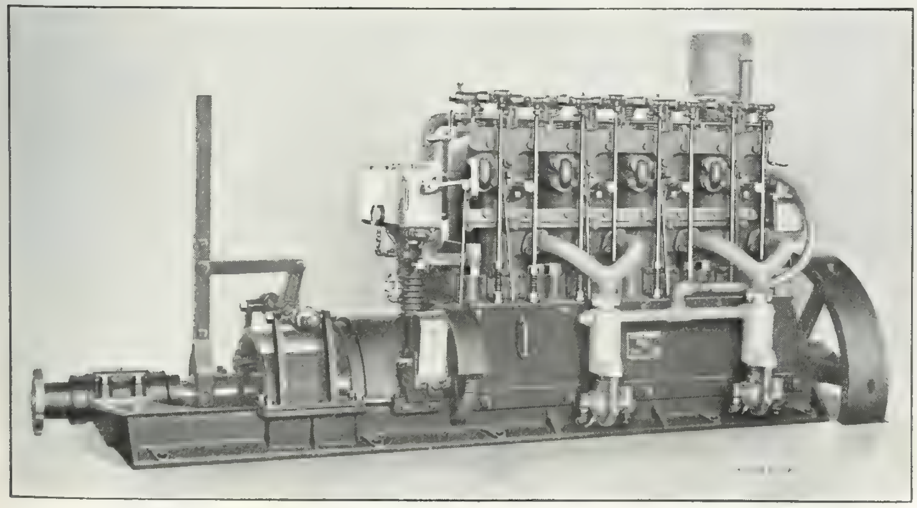
The Hicks gasoline engine had for many years been known as a sturdy and good propulsion unit, and was a favorite with the San Francisco fishing fleet. While retaining the sturdiness and dependableness of the old unit, the Hicks engine, as now turned out, is a more efficient machine and has a more graceful appearance.

The shops of the Yuba Manufacturing Company at Benicia are handily arranged for the manufacture of machinery on a large scale. Foundry, forge, machine, paint, and pattern shops are located where rail and water permit of easy handling of intake and output and make for efficient methods. Jigs for all parts, made light but firm, with hardened steel bushing, insure accuracy with no waste of time in setting stock. This system of jigs is carried all through the shop, even to a special dummy cylinder which can be used when necessary to correct any possible error which might creep into the job before final assembly.

Another feature of interest is the method developed of burnishing crank shaft bearings. By this method the surface of the bearing is finished to a most marvelous degree of perfection. Complete sets of bars for boring bed plate bearings have been made for each size of engine. Ignition arrangements on all types are interchangeable. All pistons are cast of a special iron and, after being finished to close size, are lapped to limit gauges, as are the cylinder walls. A master index plate for setting cams and ignition points is another insurance of accuracy and dependable ignition. The various movements of valves, pistons, and ignitions have all been developed in the engineering laboratory, as have been the designs for propellers, which are made to fit the engines which turn them. These propellers, as well as all other parts of the machines, are cast or forged in the plant, making it independent of outside factories.

After erection, each Hicks engine is turned over at high speed for several hours by power from a line shaft. The engine is then put on a test block and made to develop its maximum rating for several hours, being closely watched and checked by specially trained engineers. The result is a good engine. That buyers are convinced of this is evident from the orders constantly coming in for units of the several sizes.

The Hicks gas engine is now distributed by the Hicks Engine Sales Company, whose main office is in the Balfour Building, San Francisco.



The Hicks 4-cylinder, marine type gasoline engine with marine reverse gear incorporated.

Personal Note

Wm. S. Brusstar, well known shipbuilder and naval architect of San Francisco some years ago, will revisit the West Coast next August. Since the late war Mr. Brusstar has been engaged in ship chandlery and general service stores in New Orleans and has built up a very extensive connection with marine companies. He will spend a few weeks with his father, master builder for the American Dredge Company at Oakland. Two brothers of Mr. Brusstar are also shipbuilders, one in San Pedro, and the other with Wm. Cryer & Son, Alameda. Mr. Brusstar will make the trip from New Orleans by auto.

Auxiliaries—Ship Supplies—Marine Equipment

Micarta Airplane Propeller Blades

HIGH powered airplane propeller blades made from ordinary canvas compressed into a noncorrosive product of metallic strength, which greatly enhances the degree of safety in operation, will be used by the Navy Department on its training planes. The new material known as Micarta is likewise used for the manufacture of pulleys and fairleads required in the construction of airplanes, and because of its water resisting and moisture-proof nature, parts manufactured of this material have been accepted as standard equipment both by the United States Army and Navy.

As a result of a contract awarded by the United States Navy Department, 250 Micarta propeller blades for use on regular Navy training planes will be manufactured and delivered by the Westinghouse shops at East Pittsburgh.

Coincident with this announcement is the recent development in the tipping of Micarta propellers. The very latest design of propeller, brass tipped along the edges, comprised one of the features of the exhibit by the Westinghouse Company at the all American Aircraft show held recently at Bolling Field. The Micarta propeller is lighter in weight, of smoother action, and free from corrosion or warping in storage or in service.

The propeller, when bronze or brass tipped, has been found especially adaptable for seaplane use because of its capacity to resist water spray. The Micarta propellers, as well as all other parts manufactured of this material, are made principally of cotton. The process of its manufacture is, of course, a secret one, but it is commonly known that the basis of it is canvas, layers of which, impregnated with certain chemical components, have been pressed into a substance of steel-like hardness, and perfect moisture and water proof resistance as a result of the application of the tremendous pressure exerted in the moulding.

Airplane pulleys are used to guide the control wires leading from the cock pit, elevators, rudder, and ailerons, while the so-called fairleads like the pulley serves to guide the control wire, as it prevents wear of the cable which would otherwise drag on the plane frame, cross braces and other parts of the ship.

The successful application of the new type propellers by the Navy Department resulted in the application of the same type of Micarta blade for the huge C-2 transport plane used by Assistant Secretary of War F. Troubee Davison. This monster of the air, representing the very latest design of plane, equipped with three whirlwind motors giving it a speed of 120 miles per hour, arrived at Bolling Field with the official party comprised of the ranking aviation officers of the Army and Navy who attended the reception to the United States Goodwill Flyers recently.

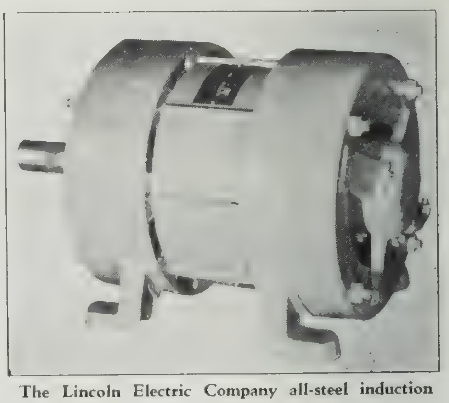
The use of the new type of propellers by the United States Government branches eventually was brought to the attention of the British Flying Forces with the result that Wing Commander T. Gerard Hetherington, R. A., Air Attache of the British Embassy, has established contact with the Westinghouse engineers to obtain all technical data regarding these propellers. Because of their exceptional resistance to moisture of any kind they would, of course, prove of especially successful use in India and other tropical countries, as they have proved successful in the Philippines, the Canal Zone, and other tropical parts of the United States.

All Steel Induction Motors

A COMPLETE line of all steel, ball bearing, polyphase induction motors, ranging in size from 1 to 100 horsepower in all standard voltages and cycles, is announced by The Lincoln Electric Company of Cleveland. This type of motor is representative of the new designs of equipment being brought out by The Lincoln Electric Company, in which gray iron and malleable castings have been entirely replaced by hot rolled steel.

It is claimed that every part of the motor is at least twice as strong as the former type which was built with a cast iron frame. An example of the increase in strength of the frame is cited in the case of the motor feet. Drop forged steel feet are welded on to the hot rolled steel end rings of the motor. This, it is claimed, eliminates a common source of difficulty with electric motors arising from the fact that cast iron feet are frequently broken off in rough handling. The end brackets or bearing supports are also made up of welded steel construction giving a complete all steel motor.

Economies in manufacturing by the new process have permitted the use of much larger shafts and bearings than is usually found on this type of equipment.


The Lincoln Electric Company all-steel induction motor.

Owing to the greater strength of steel as compared with cast iron, less thickness of metal is required in the frame. It is claimed that the increased ventilation so obtained results in a considerable increase in the overload capacity.

ERRATA

The caption under cut of thermit weld stern repairs on page 232 of May issue should have read:

The stern shoe of the S.S. West Keene, U. S. Shipping Board, was welded recently by the Thermit Process at the Federal Shipbuilding and Dry Dock Company. This weld was made through a section 8½ inches by 20 inches that was fractured adjacent to the plates.

New Gasoline Cuts Costs

THE Dayton (Ohio) Power and Light Company have just completed a test they have been conducting since 1923 and report that since adopting Ethyl gasoline they have cut their mileage costs from 10 2-5 cents per mile to 6 1-5 cents per mile, which is close to a 40 per cent saving in their delivery and truck department.

That keen business minds all over the country are accepting Ethyl gasoline as a contributing factor in lowering costs is evidenced by the great number of big truck fleet operators who have decided to test out Ethyl gasoline for six or twelve months in their own fleet and keep an accurate check of results.

In a letter to the Ethyl Gasoline Corporation, the Dayton Power and Light Company says:

"After having used Ethyl gasoline for over three years and having kept a very careful check on results, I believe you will be interested to know of our experience.

The Dayton Power and Light Company commenced using Ethyl gasoline in 1923 in its fleet of passenger and commercial vehicles, has been using it exclusively ever since, and believes that the very substantial reduction in cost per mile which has been made since then has been due in great part to the use of Ethyl gasoline. The savings are the result of greatly decreased maintenance and repair cost and increased availability of equipment and other factors of economy.

We operate 128 motor vehicles which cover a total of about 1,100,000 miles a year. Carbon cleaning in a fleet of this size, operating on regular gasoline, is always expensive as well as a major problem. This work became entirely unnecessary after we began using Ethyl gasoline. With the elimination of carbon cleaning a great reduction in other repairs coincident with it was accomplished. Under the old system, when the head was removed from the motor the mechanics frequently made other adjustments, such as grinding of valves, when not necessary. This decreased repair time at once reflects itself in increased working hours of the car and drivers, in addition to the expense of making the repairs. Since using Ethyl gasoline the fouling of spark plugs and overheating have been eliminated. This is because the motors run cooler on Ethyl gasoline than had been the case on ordinary fuel, and today the average valve grinding period on our cars is considerably better than prior to the time we began using Ethyl gasoline. Our equipment consists of a number of different types of automobiles, ranging from small passenger cars up to heavy trucks, and the very satisfactory results described were found in each type irrespective of make.

I am glad to add that the drivers are well pleased, their labors are lightened through less gear-shifting, smoother running, and more easily handled cars, and they report greatly improved car performance in general."

"Since the introduction of this super fuel to the Pacific Coast a few months ago, hundreds of western fleet operators have followed in the footsteps of these eastern pioneers and have 'put in' Associated Ethyle gasoline and are experiencing similar savings," claims an official of the Associated Oil Company.

"Our engineers who have assisted fleet operators install their 'check-up' system report that in practically every case a material saving has shown up and that actual dollars and cents saved in labor and repairs more than pays the premium charged for this 'greatest discovery in the automotive age'."

Haskelite Makes a New Record

HASKELITE, plywood preeminent in the aircraft field and equally well-known in the automobile, truck, marine, bus, electric railway, and sign fields, has added a new record to its string. In addition to being used in the Curtiss NC transatlantic planes in 1919, the Douglas world cruisers in 1924, and four Loening goodwill planes just returned from South America, it has the honor of forming a considerable part of the structure of the Ryan monoplane used by Colonel Lindbergh in his New York-Paris flight.

In the Spirit of St. Louis, Col. Lindbergh's plane, Haskelite forms the entire wing structure and the leading edges, and is used for almost the entire cabin, as well as other parts of the ship. Haskelite, only one-eighth-inch thick, is used for the wing beams. Haskelite is used for the leading edges because it is strong, rigid, light, and easily curved to the exact requirements of the design.

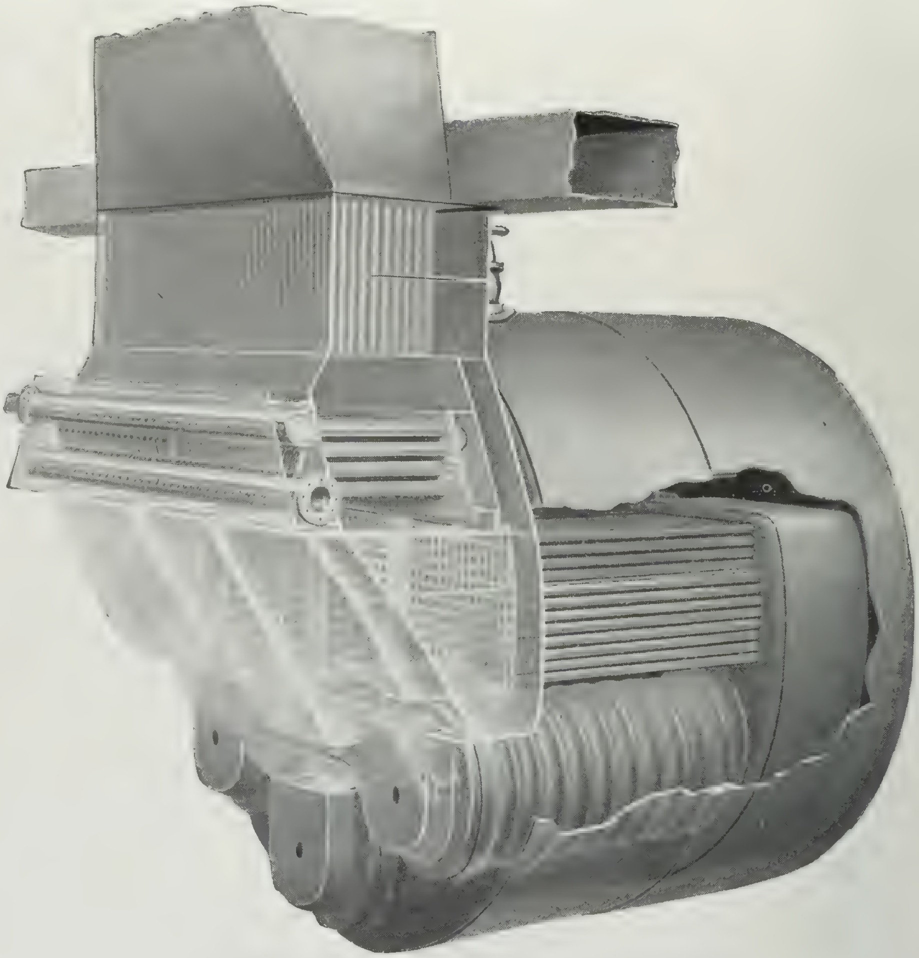
Haskelite, for the benefit of those to whom it is unfamiliar, is a material made of thin sheets of wood glued together. The strength of wood along the grain is much greater than that across the grain, and plywood is greatly stronger than wood because the plies are laid with the grain at right angles, thus giving an equal strength in all directions. The best quality plywood is made with blood albumen glue. Casein glue, sometimes used, gives a much inferior product. Blood albumen glue is the strongest and the most impervious known; so highly resistant is it to the influence of change in temperature and the softening effect of water on most glues that one grade of plywood has been boiled in water without separating the plies. It is hardly necessary to point out the desirability of strength, light weight, and weatherproofness in a material for building aircraft, the three qualities which the best grade of plywood possesses in high degree.

Except for the wings which were lengthened to carry the unusual load, the Spirit of St. Louis, is a stock Ryan monoplane, in which the best make of plywood (Haskelite) is standard construction. About Haskelite in the construction of a monoplane very similar to that which Lindberg flew, Ryan Airlines, Inc., said:

"Before announcing the new Ryan cabin monoplane, wish to advise that the only plywood used in the Spirit of St. Louis construction is Haskelite. We consider blood glue Haskelite far superior to casein glue plywood. For this reason we now use blood glue exclusively in wing construction."

Haskelite is standard in 85 per cent of American-built aircraft.

Experiences With Superheat in a Scotch Boiler Triple Expansion Freighter



Scotch marine boiler fitted with Foster waste heat type superheater.

THE obscurity which enshrouds most of the results obtained in the operation of marine power plants is due to the lack of similarity between them in operating conditions, or to the lack of sufficiently detailed data having a bearing on the test and covering all of its conditions. Many able engineers have thus found themselves in serious doubt as to the confidence which they could properly place in the claims made, and to reconcile the test results with those probably obtainable in year-round service.

A good deal of controversy has taken place in recent months as a result of reports published covering the operation of various steamers. In many cases the names of the steamers were not given, nor was there any way in which a student of steam engineering could identify the source of the information or check it up. There is a natural tendency on the part of many readers to accept published statements as facts, and it seems, therefore, particularly important that the results of steamship operation should be emphasized whenever they are sufficiently complete and accurate so that they constitute an unimpeachable record for the guidance of marine engineers and operators.

The Steamer West Haven, built by Skinner & Eddy at Seattle, is an 8800-ton, well deck cargo steamer, fitted with three single-ended Scotch marine boilers, and propelled by a 2500 I. H. P. triple expansion engine. She is owned by the United States Shipping Board, and the records of her operation have been established under the accurate system of the Fuel Conservation Committee. This is undoubtedly the most comprehensive and carefully applied of any in use with a merchant marine fleet of equal size. The story of her performance is briefly as follows:

During many months of steaming between the United States and European ports, difficulty was experienced with rings in the high pressure cylinder, and the impression that the trouble arose from the use of superheat gradually became a conviction. The superheaters were designed for 60 degrees of superheat, and it was frequently necessary to use two set of high pressure piston rings in one crossing of the Atlantic.

The West Haven is one of many sister ships owned by the United States Shipping Board, and the continued replacement of piston rings caused orders to be issued for the removal of the three waste heat type superheaters with which her boilers were equipped. Previous to this drastic step every other logical expedient had been resorted to without success, and it was, therefore, confidently believed that eliminating superheated steam from the high pressure cylinder would permit the presence of such a large quantity of condensation that piston ring wear would be overcome through water lubrication.

The superheaters were removed in Europe and the return voyage was made under saturated steam. However, two sets of piston rings were required as usual. This unquestionably demonstrated the fact that the loss of rings was not caused by superheat, and prompted a thorough investigation of other conditions. The high pressure liner was drawn and a new one, cast by the Hunt-Spiller Manufacturing Company was installed. A new piston, with new Lee Cook rings, was also provided and since then the engine operation has been faultless so far as the high pressure cylinder is concerned. Thus, it was established that the specific trouble resulted from the use of defective parts produced in the wartime emergency and was not a function of the steam temperature.

Steamers of the same class as the West Haven had been showing a lower fuel consumption, however, and for that reason it was decided to try reinstalling the waste heat superheaters. This was done, and the vessel, equipped with her original superheater complement, resumed regular schedules in April, 1925.

						Fuel Per 24 Hours	
	Date	Average Speed	Average Slip	Average Draft	Lbs. Fuel Per Mile	Barrels At Sea	Barrels In Port
Without superheat	5/16/24 7/ 4/24	10.34	11.6	16′9″	290	213.5	41.9
With 56° F. superheat	5/30/25 7/17/25	10.57	9.5	16′7″	263	198.4	37.3

The voyages subsequent to the installation of superheaters were entirely successful, no further difficulty being experienced with pistons or rings, and the fuel consumption being reduced to a point where it compared favorably with any similar ships. The attention which she had attracted due to the study of difficult conditions had provided the operators with fuel consumption figures of the utmost accuracy.

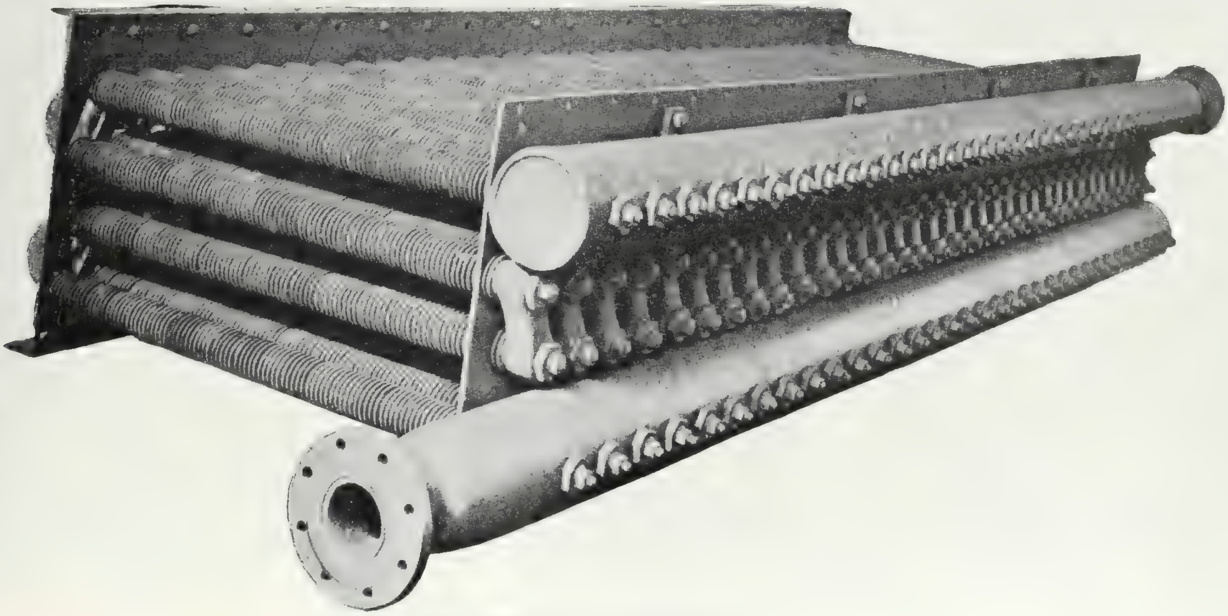
In addition to the proof, established by the foregoing experience, that superheat did not cause the repairs, it was desired to show by comparative figures precisely what the advantages produced through the use of superheat amounted to. For this purpose a detailed study and comparison were made of the voyages on superheat as well as on saturated steam, in order to find two which could be directly compared. The two trips mentioned below are remarkably close so far as operating conditions are concerned; that is, the draft of the ship, propeller slip, and average speed. Both voyages were via Baltimore, Norfolk, Rotterdam, and Antwerp. The vessel was handled by the same operators, even the same chief engineer being continuously in charge. It is particularly important to note that the voyage on saturated steam chosen for comparison was that upon which the West Haven made the best saturated steam record. Thus, there is no doubt that the comparison is conservative.

The actual fuel oil saving in pounds per mile covered was 27 pounds and the saving per day at sea amounted to 15 barrels. The saving per day in port was 4.6 barrels of oil thus fully justifying the installation of superheaters on a basis of return from the money invested.

Using a cost of $1.715 per barrel of oil, the actual mileage at sea of 45,457 miles for the year, and hours in port of 684, actual per trip given, the saving in fuel amounts to about $7600 per year. This allows ten days out of service for dry-docking and painting. Thus the figures represent regular operating totals. They are not the opinion or investigation of only one man, they are not peculiar to some special steamer and they are not abnormal. They check up logically with the operation of many sister ships from the same drawings, and the same shipbuilder; they were procured by a government bureau specializing in this work and having more time for such study, more ships under observation, and a larger competent personnel than has ever been engaged in a similar marine investigation.

Two years of satisfactory operation have elapsed since the superheaters were reinstalled, and it is thus proper to state that superheat was in no way responsible for the piston ring trouble in the first place. This information is felt to be of a sufficiently definite character to warrant careful study by students of marine engineering, especially those interested in reciprocating steam engines, because there are relatively few demonstrations as conclusive as this one and where the figures were obtained by such able and unbiased authority. The percentage of saving due to the use of 56 degrees of superheat amounts to 9.3 per cent on the basis of fuel consumed per mile. This is in no way an abnormal or unusual saving where operating conditions were not of the best when saturated steam was used.

The savings shown above in dollars per year of operating cost do not represent the total advantages from the use of superheated steam. To them must be added the reduced maintenance and repair costs accruing through the unloading of steam generating equipment. With a reduced fuel consumption of more than 9 per cent there would be a corresponding reduction in steam consumption so that the condenser feed pumps and auxiliary machinery would be relieved of appreciable portion of the duty under which they would have to operate with saturated steam.



Foster waste heat type superheater unit.

Hunt-Spiller Rings Successful

VERY often the piston rings of a reciprocating steam engine wear rapidly causing losses in power and waste of fuel. This condition happened on the steamer Capac, her high pressure rings, giving considerable trouble The Moore Dry Dock Company of Oakland, California, agent for the Hunt-Spiller gun iron products, replaced the Capac's defective rings with rings made from Hunt-Spiller material. After a run to South American ports and return, the new rings were found to have held up finely, there being no perceptible wear. So greatly satisfied with this were the operators that an additional order was given for the installation of Hunt-Spiller gun iron piston rings in the intermediate cylinders.

This special iron, known to the trade as Gun Iron, was first used over a hundred years ago by the late Cyrus Alger of Boston, a famous iron founder. Since his day refinements of manufacture have increased the strength and hardness of the metal to a surprising degree, and though originally brought out for the making of ordnance, it has been found very advantageous to use it in cylinders, piston rings, valves, and other parts of steam engines. Especially is this iron adapted to the severe conditions of superheated steam as employed on the modern steamship.

The Moore Dry Dock Company has in stock some forty tons of cylinder ring castings embracing every size apt to be required, from the smallest ring or cylinder up to well over six feet diameter, so that quick delivery can be made if required. These castings are of so close a grain and quality that very little metal needs removing to complete the ring or other part, thus making a saving in weight and costs. The steamer Capac, the first vessel on the Pacific Coast to use Hunt-Spiller gun iron in the piston rings, was formerly the Shipping Board's property, built by Duthie of Seattle in 1919 as the Deuel. Her engines are 24½ inches, 41½ inches, and 72 inches diameters of cylinders, with a stroke of 48 inches. Bought by the W. R. Grace Co., her name has been changed to Capac and she is now running in the company's South America trade.

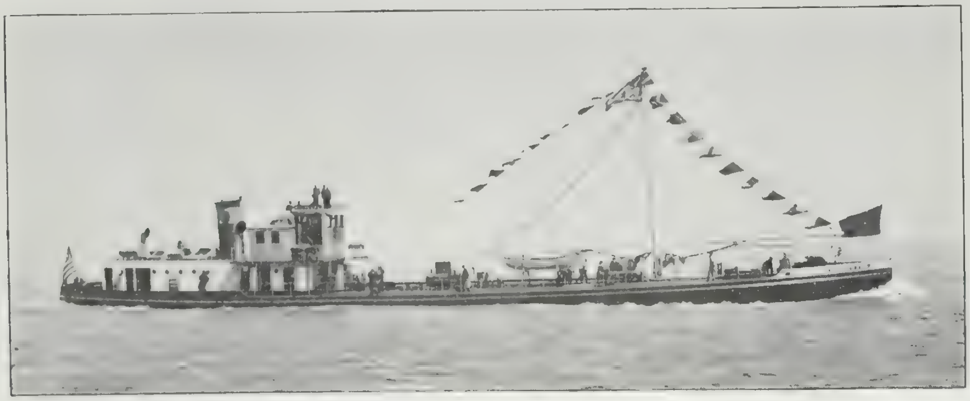
Allen Bronze Screws

IN LOCATIONS where rust or corrosion is imminent, the use of bronze in place of the various metals is frequently indicated by good engineering practice. This is particularly true of machine parts or fittings having sharp edges and comparatively thin sections subject to stress. A typical example of this is the screw, particularly in the shape of cap or set screws.

To meet particular conditions where corrosion or rust are imminent, The Allen Mfg. Company of Hartford, Connecticut, has brought out a line of screws in hardware bronze with the sockets produced by the well known Allen cold-drawn process, which insures clean, perfectly formed sockets down to the bottom. These screws, both in the cap screw type and in the set screw, are finished all over, turned true, and can be set up in counterbore holes without grinding off the sides of the screw. The threads are die cut and are accurate in pitch and perfect in lead.

The bronze used in the manufacture of these screws has practically the same initial strength as mild steel. The actual strength in use is very much greater because very shortly after installation, where moisture or corrosion fumes have been at work on steel screws, the threads quickly lose their strength. Hence using steel in these locations very much oversized screws must be used to allow for this strength reduction. It is possible, therefore, with these bronze screws to use and depend on smaller size screws than is customary in such locations with steel.

The Allen Mfg. Company has a branch office in San Francisco covering the Pacific Coast Territory. This office is in charge of W. J. McRae, who will be very glad to confer with engineers and machine designers on the use of hardware bronze screws.



Guaranteed Refractory Material

ARRANGEMENTS have recently been concluded between the Metropolitan Casualty Insurance Co. of New York and the S. Obermayer Co. of Chicago, manufacturers of Ramtite, whereby the insurance company will stand behind a guarantee given by the S. Obermayer Co. covering the uses of Ramtite.

A $25,000 bond has been arranged, the provisions of which guarantee as follows: "to all those who, during the calendar year, 1927, purchase Ramtite from The S. Obermayer Co. that the Ramtite so purchased will be made entirely of virgin refractories, without any waste material, and that it is so blended and mulled as to produce a furnace lining that, when installed by the S. Obermayer Co. or according to the practice which it recommends, will not spall nor crack within one (1) year from the date of installation; and that if the lining does spall or crack within one (1) year from the date of installation, The S. Obermayer Co. will furnish enough new Ramtite to replace the material which so fails."

A facsimile of this bond will be furnished with all orders for Ramtite.

Tycos Temperature Measures

TEMPERATURE gauges are a necessity on the modern seagoing craft, be they steam or motor driven. Adequate analysis of marine steam plants demands correct indication of temperatures of feed water, superheat, oil fuel, surrounding air of engine and boilers, uptakes, and sea water both before entering condensers and after leaving them. Without temperature registers of these factors, the engineer is seriously handicapped in efficient operation of his power plant.

In a motor driven ship, the thermometer is necessary for indicating the temperature of oil, both lubricating and fuel, and the temperature of exhaust. Any abnormal variation of temperatures warns the engineer that something is not functioning properly and through this warning serious breakdowns are many times avoided.

Besides the main engines of the vessel, the many auxiliaries need temperature regulation, especially in the refrigeration department, for here any great fluctuation of temperature might mean a loss of all fresh provisions or even a hold full of perishable cargo. Temperature registers are also installed in the cargo holds of vessels, so arranged that any rise in heat will be signalled to the officer on watch on the bridge, and thus if a fire should start the fact would be instantly and automatically indicated.

Among the makers of instruments for the purposes mentioned above, the Taylor Instrument Company is perhaps one of the best known. For many years they have specialized in the manufacture and repair of thermometers of all types, as well as many other delicate devices which are aides to safe navigation of ships, such as (Tycos) barometers, biographs, pyrometers, and delicate pressure indicators. This firm has established recently in San Francisco, at 86 Third Street, a laboratory in connection with their salesrooms, where the most delicate device along the lines mentioned can be tested, adjusted, or repaired. The firm also stocks a wide variety and range of instruments used at sea.

The views herewith show a part of the show rooms and also a portion of the laboratory. It will be noted that a full equipment of calibrating furnaces and testing pumps are used, with all the necessary precision machines required to make repairs and adjustments speedily and well.

G. F. Linsley and S. F. Worswick are in charge of the San Francisco branch of Tycos, handling from this point all the business of Northern California, Oregon, and Washington.

A portion of the showrooms of the Taylor Instrument Company at San Francisco.

A portion of the San Francisco laboratory of the Taylor Instrument Company

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Lamatco Used in the Spirit of St. Louis

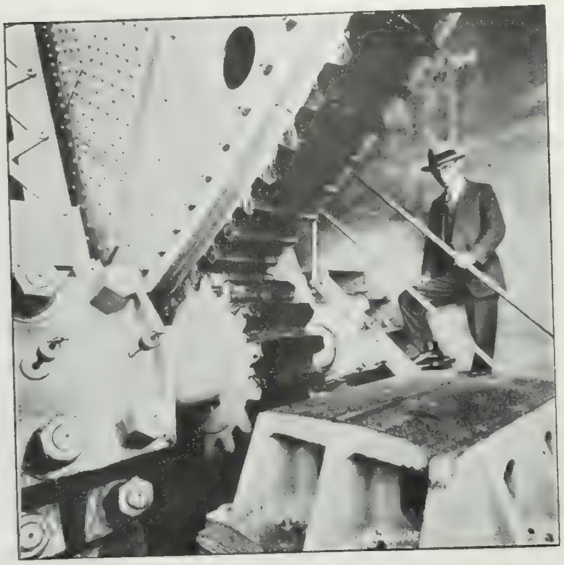
COLONEL CHARLES A. LINDBERGH'S plane, the Spirit of St. Louis, was constructed in part of Lamatco, supplied by White Brothers of San Francisco to the Ryan Airlines, Inc., of San Diego.

Lamatco is a laminated waterproof cottonwood panel of three-ply construction and guaranteed to be waterproof. Strength and lightness are the qualities necessary in the materials used in airplane construction, and Lamatco possesses these in an extraordinary degree.

It has hundreds of other uses besides those of wing construction and fuselages. Its light weight, strength, and water-proof qualities make it ideal for wall panels on steamers. It takes paint or enamel perfectly and its large surfaces make it especially adaptable for this purpose.

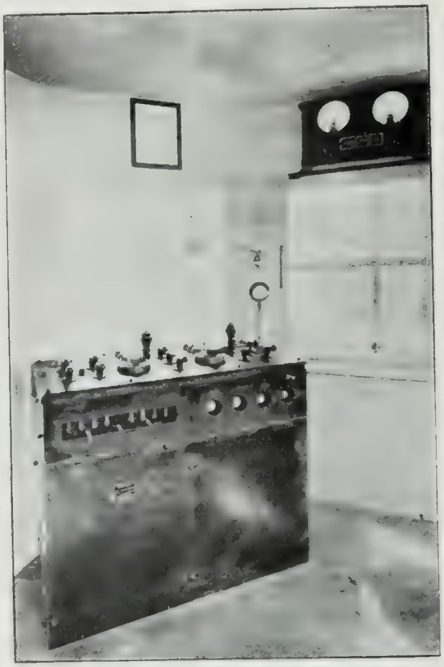
Portland Bascule Bridge

THE Burnside Bridge, one of the most important at the city of Portland, Oregon, has the distinction of being the first large bascule bridge to be built with reinforced concrete pavement of the moving leaves. The bridge is a double leaf, deck type Strauss trunnion bascule bridge with underneath counterweight. It is 83 feet wide and 252 feet long from center to center of the main trunnions. Each moving leaf with associated parts weighs 3000 tons.



Pinion and rack of the Burnside Bridge at Portland, Oregon.

The bridge was designed to operate safely, quickly, and efficiently. The massive moving leaves may be rotated upon the pivotal supports through an angle of 73 degrees in 1¼ minutes. Two Westinghouse 70-horsepower motors applied to the operating machinery of the leaves supply the necessary means of operation. In order to hold the leaves in the open position against high wind pressure each leaf is equipped with two emergency solenoid brakes in addition to the solenoid brakes that are applied to each of 70-horsepower motors. With the aid of these emergency brakes the open position can be maintained against a wind pressure of 15 pounds per square foot.



A control room of the Burnside Bridge, Portland, Oregon.

The operators' houses are equipped so as to take care of any emergency that may arise. There are two of these houses, one on each side of the channel. One house is equipped with control for both leaves, and the other has the control equipment for one leaf only. With the operators' houses equipped in such a manner it is possible for the operator in one house to control the operation of both leaves if necessary.

Precaution has been taken against the possibility of failure of power supply by arranging for two independent sources of supply, using 550 volts direct current. If one of these sources should fail the operator can instantly throw over to the other supply by means of a double throw switch. Power for the gate motors, lock motor, signals, and lighting are supplied at 110 volts alternating current.

This bridge was designed by the Strauss Bascule Bridge Company of Chicago, and motors and control were supplied by the Westinghouse Electric and Manufacturing Company. The limit switches, bridge and pier lamps and navigating lights were furnished by the Norwood-Noonan Company of Chicago.

Reorganization Note

THE Prest-O-Lite Co. announces the sale of the Storage Battery Branch of its business to a new company, Prest-O-Lite Storage Battery Corporation. The entire capital stock of the purchasing company is owned by the Automotive Battery Corporation of New York. That portion of the Indianapolis plant of The Prest-O-Lite Co., Inc., used for the manufacture of storage batteries has been leased to the new company.

The Prest-O-Lite Co., Inc., while discontinuing the Battery Branch of its business, will continue the manufacture and sale of acetylene gas for use in the oxy-acetylene process of welding and cutting metals, automotive lighting, lead burning, etc. These operations have, in the past, constituted the major portion of its activities. In addition to continuing its acetylene business, involving the operation of thirty-two acetylene plants, located in industrial centers throughout the country, The Prest-O-Lite Co., Inc., will continue operation of that portion of its Indianapolis plant devoted to the manufacture of gas cylinders, acetylene generators and other apparatus.

Steamer going through the Burnside Bridge.

New York Echoes of San Francisco Banquet

MEMBERS of the San Francisco Association of Marine Underwriters—provided their usually alert machinery of ratiocination was not permanently impaired by the events of the evening — will remember that a feature of their last annual banquet was a burlesque meeting of the Adjustment Committee, including the consideration of what purported to be an adjustment of "general and peculiar average" on the good ship "Association" covering its stormy voyage of the previous year.

The Fireman's Fund Insurance Company, through their New York office, solemnly submitted the "adjustment" to the Adjustment Committee of the Board of Underwriters of New York. The letters of enclosure and comment, and the committee's recommendation are set forth below.

HELL-BENT

Old Brother Gabriel yawned and pulled his whistle cord
(You see, he never used his trumpet when aboard)
And out of all the troubled waters sped a horde
Of ships. Now ships is hard to stop on Judgment Day,
There ain't no box to break, nor stones to push away—
So up they came, the ghostly lot of 'em, to pay
Their customs fines and harbor dues. The sea
Was full of rusty tramps and galleons, set free
To shape a course for quarantine off Peter's Key.

Of course the Heavenly Harbor has its quarantine,
And every single scow and every barkentine
Must file her log and protest. Cap'n Peter's keen
On evidence. He gets survey reports on every claim
To lay before the Great Adjuster, with the aim
Of checkin' up and sending back the ones that came
With manifests that reeked of booze and contraband
And broken warranties. A fleet condemned they stand
To liftin' coals for Skipper Satan's black command.

Avast there, mate. How sets **your** ship adrawing' well
With trades astern and billowin' sails that swell—
Or are you chartered out for haulin' coal in hell?

J. A. Q.

March 1, 1927.

Mr. E. G. Driver,
The Board of Underwriters of New York,
New York City.
Dear Sir:

S. S. "Association"

I am attaching statement of general and particular average, etc., in this case which no doubt will be examined by the Adjustment Committee in due course.

There are several questionable items included in this adjustment and I call particular attention to the treatment of exchange on Page 14 and the charge for commission included on the same page.

I hope there will be no charge for the examination of this adjustment.

Yours very truly,
Assistant Manager.

HER EM FF

Thames & Mersey Marine Insurance Co.
33 South William St.,
New York,
March 21, 1927.

E. G. Driver, Esq. Secretary,
The Board of Underwriters of New York,
56 Beaver Street,
New York City.
Dear Sir:

S. S. "Association"

I return the Adjustment of the above vessel which you were good enough to let me take away for intensive examination.

In addition to the item to which Mr. Reed very properly calls attention, I find on page 17 a veiled innuendo leveled at New York Underwriters which I feel calls for our committee's stern disapproval.

Under the circumstances, it is my thought that the Adjustment be "unapproved with prejudice."

Yours very truly,
(sgd) A. B. GRANT.
Deputy Ass't Manager.

Appleton & Cox, Inc.
1 So. William St., New York.
March 21, 1927.

E. G. Driver, Esq.,
56 Beaver Street,
New York.
Dear Sir:

S. S. "Association"

I have carefully examined the adjustment indicated above. I am returning it to you.

It seems to me that the whole general average loss arose from insufficiency of the tanks. This condition might be due to wear and tear or to inherent vice. In either case I cannot agree that it should give rise to a general average.

Arthur M. Brown **EDWARD BROWN & SONS** *Arthur M. Brown, Jr.*
MARINE DEPARTMENT—*Harry W. Browne, Manager*
PACIFIC COAST GENERAL AGENTS
THE GLOBE & RUTGERS FIRE INSURANCE CO., INC.
200 BUSH STREET, SAN FRANCISCO

FIREMAN'S FUND
Insures Hulls, Cargoes,
HEAD OFFICE: CALIFORNIA and SANSOME

JOSEPH HADLEY,
European Agent
3 LOTHBURY, E. C
LONDON

E. A. VALENTINE, Resident Agent for Oregon
714-715 BOARD OF TRADE BUILDING
PORTLAND, ORE.

FRANK G. TAYLOR, MANAGER, PACIFIC NORTHWEST BRANCH

We note Mr. Reed's apparent objection to the treatment of exchange and charge for commission on page 14. We are sorry to say that we cannot agree with Mr. Reed in his objections. It seems to us that the treatment of exchange and commission on this page is in accord with the general practice of adjusters.

We wish to call attention, entirely without prejudice, to the charges of the Good Fellow Shipyards on page 14. It seems to us that, in view of the number of lay days, the bonus is entirely inadequate especially in view of the fact that it accrues to the oldest profession in the world.

We do not agree with Mr. Grant as to the "veiled innuendo leveled at New York underwriters" on page 17. We believe the apportionment fairly represents the various amounts of business as usually placed in San Francisco, London, and New York on trips of this kind.

We do agree with Mr. Grant that the adjustment be "unapproved with prejudice."

Yours very truly,
(sgd) E. W. MURRAY.

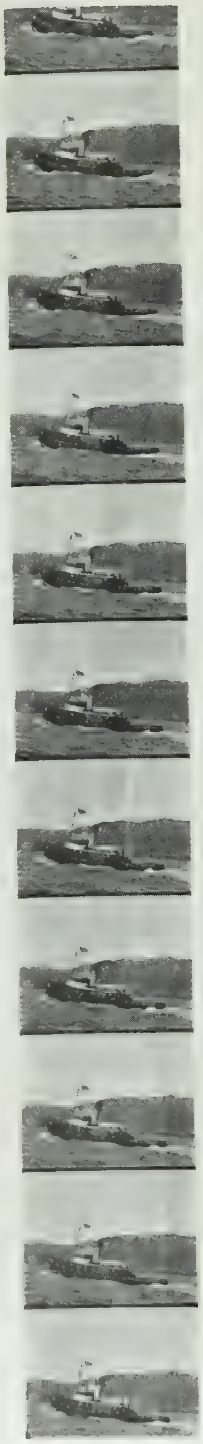
Union Marine Insurance Company,
47 Beaver Street, New York.
March 23, 1927.

E. G. Driver, Esq.,
56 Beaver Street,
New York City.

"Association" (s) On fire during voyage

My congratulations to the party or parties who did the stewing and laboring over this peculiar no-claim statement. However, I think he (they) failed miserably when they neglected to disallow the "fire damaged" cargo.

Yours respectfully,
(sgd) LAWRENCE WAGLE.



Adjustment No. 13
United States Wrecking Association
Excerpt Statement
of a
Rough Adjustment
S. S. "Association"

Jan. 30, 1926—Alleged Heavy Weather due to encephalitis

Jan. 30, 1926—This vessel sailed from San Francisco bound for nowhere in particular, seaworthy.

At 6:30 p. m. the first call for dinner went by unnoticed because the man on lookout duty mistook the Golden Gate for the North Star and all hands had fled to cover under the impression that the fog horn was a policeman's whistle.

As for the rest of the night, the least said the better. The Master reports that, if anything happened, he didn't notice it.

The bills of lading are still unpaid, being contrary to the Volstead Act.

Disbursements

No statement of disbursements and allowances is necessary as they are up to form in most respects.

We find that the adjustment has been stated with the usual confusion of intellect.

We especially commend the treatment of exchange and frank and ingenious expression of friendship for the New York Underwriters.

Our expert advisers state that in their opinion the damage to the cork screw was entirely due to wear and tear.

We recommend approval and settlement as stated, if underwriters can secure assurance another like case will not be perpetrated.

United States Wrecking Association,
(sgd) I. DuTwo,
Chief Wrecker.

Bill for Services
Adjustment No. 13
Adjustment Committee
To the U. S. Wrecking Association
FOR: wasting several hours in serious study of this adjustment before we discovered it was not a bona fide statement..........$25.00
CHARGES REVERSED.

INSURANCE COMPANY
Freights and Disbursements
STREETS, SAN FRANCISCO, CALIFORNIA

W. H. WOODRUFF, Manager, Southern California Marine Branch
740 SOUTH BROADWAY
LOS ANGELES

CHARLES R. PAGE, Manager
ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

309 COLMAN BUILDING, SEATTLE, WASHINGTON

Bargain Rates

OLD COLONEL ZINKE of Nubian, Limited, stopped me on the street the other day and he says to me, says he, "Barney, my boy, I'm worried about my marine insurance."

"That's nothing new," I pipes back. "Your underwriter is too."

"The point is," bleats the old gent, wavin' my gentle persiflage aside with his all-weather perfecto, "I've been insurin' all my stuff with Marshall's office. Now Marshall's a good chap—a rattling good chap, Barney, and he gives me the ten per cent rebate that I save on a broker, but somehow my competitors seem to do better than I do in the open market."

"Sure," says I, "something like one of these bargain stores where you buy a fifty cent necktie for eighty-nine cents with ten off for cash, eh?"

"Exactly. Now I don't want to leave Marshall. He's conservative, but he's had my account for fifteen years, and whenever I've had a loss, his check's been in my hands before I got a chance to make out my loss papers. Why many's the time he's said to me, 'Colonel, if you say so, that's enough for me'—and yet—"

"Oh, so that's it," I breaks in, "you've been bit by the bargain bug."

"What's that?" the old boy asks.

"This play-the-market graft—get it for the lowest price—the other fellow does—why shouldn't you? Oh, I know the line. Who's been on your trail?"

"Well," he admits, "Lane, of Lane, Bell and Lane, the brokers, has been talking to me. Do you know them?"

"Do I know 'em," says I, drawin' a deep breath like a 1919 after-dinner speaker, "I know so much that I feel guilty every time I conceal it. I never know whether to broadcast my knowledge and wrestle with a suit for slander, or keep quiet and suffer a case of aggravated incompatability with my own personal conscience, if any. What I think of that gang of pocket lifters would read like the lines the authors of "What Price Glory" were afraid to use. What I know—"

"Now wait a minute, wait a minute," soothes his nibs, "aren't you a trifle severe? They have a fair appearance and they're certainly getting the business."

"So is a blonde," I snaps, "but they're not bein' appointed custodians of any orphan asylum. So you're playin' around with Lane's eh? I didn't think it of you, Colonel."

The old boy was kinda upset. "You know I don't want to quit Marshall," he wailed, "but what can I do? I gotta meet competition, haven't I? And a margin of a tenth of one per cent is getting to be mighty important, the way the market is now. Sanchez deals with the same people I do, and he pays the same rate I do for his insurance—only he gets coverage against sweat and moisture however caused, and God knows what else. Why, his open policy is fairly covered with clauses insuring against one thing and another. My policy hasn't been changed in ten years. Marshall is behind the times. Every time I speak to him about it, he says 'Well, haven't I always treated you right?' He says covering sweat damage on my stuff isn't underwriting—it's suicide."

"He's right," I comes back. "Now about this policy of Sanchez. Did you read all of those trick clauses?"

"Most of 'em," says the Colonel.

"And," I hammers at him, "how many of 'em did you understand?"

The Colonel rubbed his chin. "That's beside the point. They were the ordinary clauses—"

"Yeah, the ordinary trick clauses, put in so the cause of damage, or some other little unimportant item, is so obscurely worded that an assured has about as much chance of provin' his claim as I have of winning the prize doily at the Needlework Guild. Outfits like Lane, Bell and Lane draw up those clauses, and they go around and force otherwise sane underwriters to write 'em at absurd rates, just to get the business. Ever since the war, there's been a school run by old Dame Experience for young insurers, and a lot of 'em haven't learned yet that it's the old balance sheet—not the amount of business written, that leads the wily contingent fee into the home coop at the end of the year. They go out to get business, and after they've got so much they don't know what to do with it, the loss ratio starts cuttin' into their margin. Their trick rates can't be changed, so they start lookin' at the losses with a microscope."

"But Sanchez tells me he has collected several losses under his policy, and they paid up without a murmur—"

"Yeah," says I, layin' my hand on his shoulder and speakin' in a hushed voice, like the woman of the world talkin' to the ingenue in the third act, "but suppose a big loss comes along? Now with Marshall, you're safe—you can sleep nights on the certainty that if you read in the morning that the good ship Minnehawhaw has gone down with umpty thousand cases of Zinke's canned meridians, old Marshall's pay-paper will be in the well-known sock by sun-down.

"And moreover," I continues in my best manner, "this bargain hunting is a disease. This year you'll be content with takin' a respectable cut from some semi-respectable company. Next year you'll have had a taste of

Balfour, Guthrie & Company
(Established 1869)

MARINE INSURANCE

Agents for
AMERICAN AND FOREIGN
UNION OF CANTON
BRITISH AND FOREIGN
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LONDON & GLOBE
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(Marine Department)

HARTFORD
Fire Insurance Co., Ltd.
(Marine Department)

CANTON
Insurance Office, Ltd.

LOUIS ROSENTHAL
General Agent
302 California Street

JOHNSON & HIGGINS

INSURANCE BROKERS
AVERAGE ADJUSTERS

311 CALIFORNIA STREET, SAN FRANCISCO, CALIFORNIA

ROY C. WARD GEO. B. DINSMORE WILFRED PAGE
GEO. E. BILLINGS COMPANY
308-12 CALIFORNIA STREET, SAN FRANCISCO. DOUGLAS 6400
INSURANCE
BROKERS FOR THE ASSURED—AVERAGE ADJUSTERS

it, and you'll let yourself be talked into a come-on policy that gives Lane twice as much commission and you half as much protection. No, Colonel, you stick to Marshall. What's a few cents for the quality of honest, dyed-in-the-wool service you get from him?"

The old gent looked at his watch.

"Where you goin', Colonel?" I asked.

The Colonel shuffles from one foot to the other—the other bein' less afflicted with gout. "Well, Barney," he says, "I'm goin' down to keep an appointment with Lane, Bell and Lane."

Good Faith in Reinsurance

THE danger of concealing material facts in policies of original coverage is well-known, but there is a tendency to believe that a reinsurer is stuck for anything that the original insurer has to pay. This fallacy received a serious blow in the decision of the New York Supreme Court (Appellant Division) in the case of the steamship Keresan, 1927 A. M. C. 577.

In December of 1919, the Merchants & Shippers Insurance Company issued a policy covering a shipment of lily pips from Hamburg to New York. The coverage was under the ordinary F. P. A. Institute Clauses, but with the addition that the prolongation clause was added, making the insurer liable for deterioration if the voyage lasted longer than 21 days.

The Merchants & Shippers sought reinsurance with the St. Paul Fire & Marine Insurance Company after the vessel had sailed, but neglected to mention the existence of the prolongation clause, the fact of sailing, or the specific nature of the cargo.

On leaving Hamburg, the Keresan grounded in the Elbe River while anchored at low tide, but later floated unassisted and proceeded. Just before sailing, the coal in her bunkers became so heated that the master called the fire department. Fire did not actually break out. Because of rough weather, the voyage was prolonged over thirty days, and the vessel did not arrive until January 17, 1920. Some time thereafter, the Merchants & Shippers notified their reinsurers that there was a claim, and "that in addition to a fire on board, this vessel was stranded."

The assured under the original policy filed suit against the Merchants & Shippers for damage to the lily pips due to sprouting. This action was compromised for $20,000, the St. Paul giving their assent to the settlement in May, 1923. Shortly before this the St. Paul had learned of the nature of the cargo, which in the original application for their policy had been described as "merchandise."

The Merchants & Shippers then made demand upon the St. Paul for contribution to the settlement. The St. Paul, upon learning full particulars of the prolongation clause and of the actual circumstances of the so-called fire and stranding, refused to pay, and the original insurer brought the present action.

The court held that the Merchants & Shippers concealed two material facts which it either knew or should have known—the nature of the cargo and the incidental existence of the prolongation clause. It was pointed out that the term "merchandise" was not a sufficiently definite description of a commodity which was particularly susceptible to certain kinds of damage.

Reinsurer Not Estopped by Consent to Settlement

The Merchants & Shippers made much of the point that the reinsurers were not entitled to rely on concealment prior to the settlement since they had actually assented to the settlement. It was held, however, that the St. Paul was entitled to rely on the good faith of the original insurer and when the Merchants & Shippers advised that the ship had stranded and been on fire, they did not carry out their full duty to disclose the controversial nature of these occurrences. The St. Paul were consequently not estopped to deny that their assent to the settlement was fairly obtained.

The court—as is customary with courts—rests its decision on the points above noted, padded out with

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numerous dry and pedantic references to "uberrina fides," and stereotyped references to Arnould and the Marine Insurance Act. The principles of the decision, however, appear to be essentially sound, which is more than can be said for some of the maritime efforts of New York state courts, notably in the Corsicana and Rensselaer cases.

As the decision rests entirely upon the point of concealment, the court expressly refrains from a ruling on the fire and stranding. There is a strong inference between the lines, however, that neither of these synthetic accidents was of a nature to open the warranty.

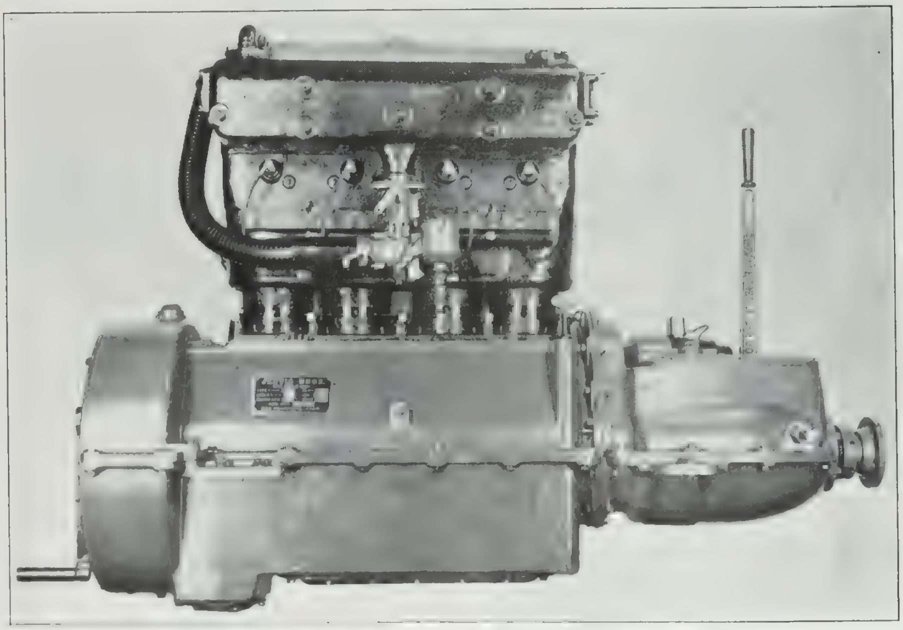
Chief Engineer R. C. Dwyer, chief of the new Matson liner Malolo, formerly first assistant on the Leviathan.

The Jervis Marine Gas Engine

LESTER JERVIS, Vincent Jervis, and their brother, Roy, are three young men of San Francisco who, working together, have taken the rough block and bedplates of a well-known eastern-built 4-cylinder gas engine and built into it improvements of their own.

A photographic view of this engine is reproduced here and shows a most compact and sturdy machine. It will be noted that the head is different from the general run of such engines. Also that the intake air is brought to the carburetor from the upper part of the engine after being highly heated. It will also be seen that the engine is free from all outside moving parts, there being nothing to catch dirt, throw oil, or be broken by falling objects. On the left-hand side of the engine there is nothing in view to break the smoothness of the structure but four spark plugs, for these engines are provided with dual ignition. The cranking gear is set above the shaft center line, and, while the engine turns to the left, the cranking is done by right-hand turns, without chains or pawls. This feature is exceptionally worth of notice. Its simplicity is remarkable, the gear can be engaged at any point, and it immediately and positively disengages the instant the engine starts under its own power, with no danger of a "kick-back."

One of these engines has been operating for some months in a 32 by 8-foot cruiser, turning a Hyde propeller 1050 revolutions per minute with no vibration whatever. Jervis calculated the engine to make 1000 revolutions with the 20 by 16-inch wheel, remarkably close figuring. At the revolutions per minute mentioned the craft makes 12 miles per hour. The cylinders of the engine are 4½ inches diameter by 6 inches stroke. Crank shaft is heavy and hollow, with a full forced feed lubrication system for all parts of engine. The complete unit is shown, with Joes reverse gear, weighs 1200 pounds. The highest grade of accessories are built into the job, such as Oberdorfer pumps, Zenith carburetors, and Splitdorf ignition.


The Jervis Brothers marine gas engine, with Joes gear.

Recent Haskelite Promotion

JAMES R. FITZPATRICK has been made vice-president of the Haskelite Manufacturing Corporation. Mr. Fitzpatrick continues as secretary and member of the board of directors. He also continues in charge of sales.

Briefly, he has been with the Haskelite Manufacturing Corporation ganization in 1917 and has served in all capacities from factory since a few months following its or- manager to purchasing agent and sales manager.

Mr. Fitzpatrick is very active in trade associations in the electric railway field. At the present time he is a member of the American Electric Railway Association Special Manufacturers' Committee and a member of the Committee on Meetings and Subjects. He served on the American Electric Railway Association Exhibit Committee in 1925. He is a member of the American Society of Civil Engineers and the Society of Automotive Engineers.

Mr. Fitzpatrick is a graduate of the Rensselaer Polytechnic Institute of Troy, New York.

CHEAPER WATER AT HONOLULU

An announcement was recently received from the Chamber of Commerce of Honolulu that, after advocating for many years a reduction in the cost of water supplied to vessels docking at Honolulu, the Board of Harbor Commissioners has at last put a cheaper rate into effect. On April 20 a 50 per cent reduction was authorized, the rate now being 75 cents per thousand gallons to all transpacific vessels.

American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Shipbuilding Work in Prospect

From the dearth of shipbuilding contracts now becoming so alarming to the future of American shipyards, we are at least partially relieved by the realization that the intercoastal and coastwise services of our steamship lines are finding it necessary to add new and up-to-date tonnage.

P. A. S. Franklin, president of the International Mercantile Marine Company, announced at a meeting of the board of directors on June 6 that an order would be placed shortly for a sister ship to the liner California now under construction at the plant of the Newport News Shipbuilding & Drydock Company.

The California is the largest vessel yet laid down in an American yard. She is 600 feet long, 80 feet beam, and 30 feet draft, of 22,000 tons displacement. She will be of turbo-electric drive, having 12 Babcock & Wilcox oil-burning boilers supplying steam to two General Electric turbine driven generators. Her horsepower rating will be 17,000, giving her a speed of 18 knots. The California will be launched in October. The new vessel, like the California, will be operated in the intercoastal service of the Panama Pacific Line.

WILL INSTALL DIESEL ENGINES

The Foss Company of Seattle, C. Arthur Foss, manager, owners of the Foss Launch and Tug Company of Tacoma and Port Angeles, recently purchased seven diesel engines of 500 horsepower each from the Navy Department and will utilize them in dieselizing their fleet of tugs. The engines were built by the Busch-Sulzer Bros. Diesel Engine Company of St. Louis for installation in submarines which were to have been built at the Mare Island Navy Yard, and they are of the 4-cycle, 6-cylinder type.

It is reported from Seattle that C. Arthur Foss and the Ballard Marine Railway Co. of Seattle are consulting on plans for the construction of three heavy duty tugs, for the accommodation of part of this purchase.

It is announced that electric drive may be tried in some of the installations. The Foss fleet consists of twenty-seven tugs and sixty scows, and the new engines will make the fleet the largest in horsepower of any towboat fleet on the Pacific Coast.

INTER-ISLAND STEAMER PLANNED

The Inter-Island Steam Navigation Company of Honolulu announced, the early part of June, that plans have now been decided upon for the construction of the new steamer which they have long been contemplating for service between Honolulu and Kauai to carry passengers and freight.

The new steamer in appearance will be somewhat like a small Malolo with her cruiser stern and her slightly raked stack and masts and long deck lines. She will be 310 feet long, 48 feet beam, 16 feet 6 inches draft, with horsepower of 4000 giving her a speed of 15 knots.

Her propulsion unit will consist of four water-tube boilers supplying steam to twin double-reduction gear turbines, which will drive twin propellers.

Accommodations will be provided for 218 first class passengers and 100 steerage. Her passenger accommodations are to be situated on the two upper decks and consist of rooms containing two beds, each room also having running water. There will be twelve staterooms with connecting baths. The dining room will be situated on the main deck and will have seating capacity for 107 persons. The plans have been carefully worked out for comfortable travel on tropical seas. Side ports will provide for loading and discharge of passengers' automobiles.

Specifications are now being drawn up and bids will be called soon from yards on both the Atlantic and Pacific Coasts. A. H. Armitage is general manager of the company, and J. E. Austin is operating manager.

BIDS FOR CUTTERS OPENED JUNE 21

Bids were opened June 21 at the office of the U. S. Coast Guard, 14th & E Sts., N. W., Washington, D. C., for the construction of five Coast Guard cutters, to be 250ft. long, 42ft. molded beam, with turbine-electric drive, giving shaft horsepower of 3000. Order for machinery for the first three cutters has been placed with Westinghouse.

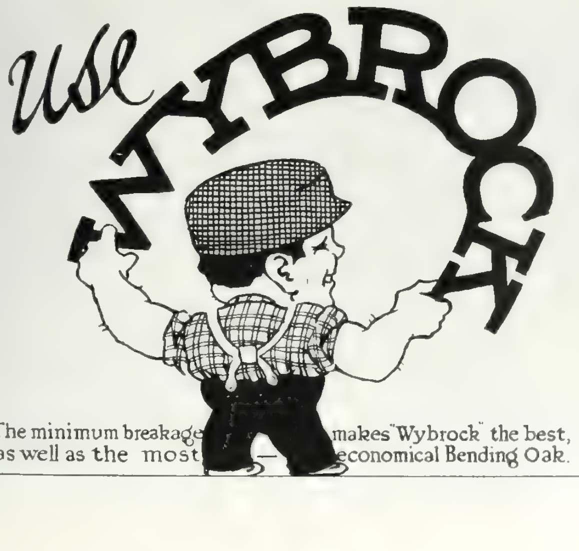
Practically all of the leading yards on the Atlantic Coast submitted bids. The only Pacific Coast yard bidding was the Bethlehem Shipbuilding Corp., San Francisco.

Bids Asked for Power Plants for Cutters

The office of the United States Coast Guard, Washington, D. C., has called for bids to be opened July 1 for the propulsion equipment for Coast Guard cutters 48 and 49. Turbo-electric machinery is to be installed in these two cutters. Bids have previously been called for construction of the hulls of five cutters and are now under advisement. Contracts for turbo-electric machinery for the first three cutters, Nos. 45, 46, and 47, have already been placed with Westinghouse Electric & Manufacturing Co.

BIDS OPENED FOR CANADIAN VESSELS

Bids were opened on June 15 for



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the construction of five passenger and cargo steamers for the Canadian Government Merchant Marine, Ltd., for their West Indies service. The ships are to be 425 ft. long, 60 ft. beam, and 31 ft. 6 in. depth. They are to have all modern accommodations and equipment for semi-tropical service and will be built to the highest classification for Lloyds and the British Corporation. Bids were asked from Canadian shipyards only.

PLANS FOR LIGHT CRUISERS

It is reported that John F. Metten, for many years chief engineer of Wm. Cramp & Sons Ship & Engine Building Company, Philadelphia, will head a new firm which will perform the services of a central drafting office for the preparation of detailed drawings for the six light cruisers to be built by various yards for the United States Government. This firm, the Marine Engineers' Corporation, will probably to some extent purchase materials for these cruisers. Stock in the firm is held by Bethlehem Shipbuilding Corporation, American Brown Boveri Electric Corp., and Newport News Shipbuilding & Drydock Co., all three of which have contracts for cruisers. The Puget Sound Navy Yard and the Mare Island Navy Yard will also buy detailed drawings and specifications from the Engineers' Company.

MORE BARGES FOR INLAND WATERWAYS

The Inland Waterways Corporation, Washington, D. C., recently placed orders with three shipyards for 25 covered barges (see Recent Contracts), with the proviso that the contracts might be extended to include an additional 20 barges.

LUCKENBACH MAY BUILD

It has been reported to us that the Luckenbach Steamship Company, with head offices at 44 Whitehall Street, New York, has sent out specifications to American yards for the construction of two 12,000-ton, deadweight, freighters for the intercoastal trade. The freighters are designed for geared turbine drive of 14,000 h. p., giving a speed of 16 knots. The vessels will probably be duplicates of the Andrea P. Luckenbach, 496 ft. long, 68-ft. beam, 40 ft. depth.

R. C. Thackara is general manager of the company, Austin B. Carlson is operating manager, and W. L. Green is superintending engineer.

BIDS OPENED ON FERRYBOAT

The Quartermaster Corps, Governors Island, New York, opened bids on May 2 for the construction of a 128-ft. ferryboat. Alternate bids were asked on direct diesel drive and diesel-electric drive.

The lowest bid was submitted by H. B. Spear, Spear Engineering Corp., Norfolk, Va., for direct drive with a Bessemer 6-cylinder, 420 - horsepower diesel engine, $202,000.

Next lowest bid was submitted by the Charleston Dry Dock & Machinery Corp., Charleston, S. C., for direct diesel drive, $243,253 for Lombard diesel engine and $243,533 for Winton diesel engine. This yard also submitted lowest bid for diesel-electric drive, $255,906, specifying Winton engines.

The City Commission of Mobile, Alabama, has under consideration the purchase or construction of a fireboat.

CHESAPEAKE LINE PLANS VESSEL

Among the prospective jobs for American shipyards in the near future is the reported construction of a coastwise passenger and freight steamer for the Chesapeake Steamship Company of Baltimore, Maryland. This vessel will replace the str. City of Annapolis which was sunk in a collision last February. The new vessel will in all probability be built along the same lines as the Annapolis, with certain improvements incident to up-to-date equipment and facilities. The City of Annapolis measured 261ft. 6in. in length, 53.1 feet beam, and 14.1 feet depth, of 1923 tons deadweight, and powered with triple expansion reciprocating engines developing 2300 indicated horsepower.

The program of replacements and modernization of shipping facilities which we have been predicting as inevitable for American lines in the next few years seems to have been given serious thought by some of our coastwise and intercoastal lines.

It is reported that the Panama Railroad Company, with headquarters at 24 State Street, New York, is making plans for replacements and additions to their fleet.

Henry J. Gielow, Inc., naval architect, 25 West 43rd Street, New York, is preparing plans for a 260-ft. diesel yacht.

The New Orleans office of the U. S. Army Engineers are drawing up plans and specifications for a 85-ft. steel hull inspection boat to be powered with two 6-cylinder diesel engines.

Theodore E. Wells, naval architect of New York is preparing plans for a 235-ft. steam-electric yacht.

Cox & Stevens, naval architect, 341 Madison Avenue, New York, have asked for bids for the construction of a fireboat for the City of Buffalo.

It is reported that the Pittsburgh Steamship Company, Pittsburgh, Penn., is planning the construction of two bulk freighters.

Recent Shipbuilding Contracts

American Bridge Company, Pittsburgh, Penn., has an order from the Mississippi River Commission, at Memphis, for 13 barges to be 130 by 30 by 7 ft. 6 in.

This yard also has an order from the Inland Waterways Corp., Washington, D. C., for 10 covered barges to be 126 by 33 by 7 ft. 6 in.

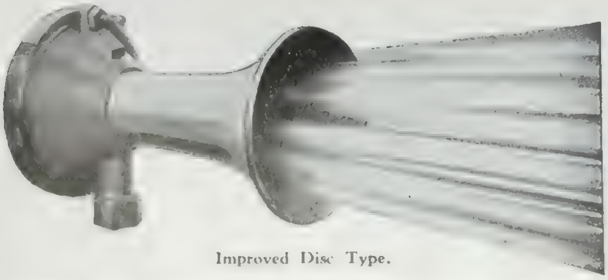
Charleston Dry Dock & Machinery Co., Charleston, S. C., is building a lighter for stock.

Dravo Contracting Co., Pittsburgh, Penn., has an order from the Inland Waterways Corp., Washington, D. C., for 10 covered barges 126 by 33 by 7 ft. 6 in.

This yard also has an order from the

CUNNINGHAM

MARINE AUXILIARY EQUIPMENT



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The McCaffrey Co. ....San Diego

U. S. Engineers Office at Philadelphia for two steel deck scows, 120 by 30 by 10 ft.

Midland Barge Company, Midland, Penn, has an order from the Inland Waterways Corp., Washington, D. C., for 15 covered barges 126 by 33 by 7 ft. 6 in.

Nashville Bridge Co., Nashville, Tenn., has an order for four deck barges.

Prince Rupert Dry Dock & Shipyard, Prince Rupert, B. C., has an order from Lars Voge for a 61-ft. halibut boat; an order from Gammon & Watt for a 64-ft. fishing boat; and from Rupert Marine Products Co. for a 58-ft. scow.

Mojean & Ericson, Tacoma, Wash., has an order from the Magnolia Tugboat Co., of Tacoma, for a tug to be 85 ft. long, 17½ ft. beam, to be powered by a 240-horsepower Fairbanks-Morse diesel engine; keel to be laid about June 15.

Bethlehem Shipbuilding Corp., Union Plant, San Francisco, has an order from the U. S. Smelting & Refining Co., Oakland, for seven steel dredges and part of the machinery. The dredges will be 140 ft. long and of 10 cu. yds capacity.

Wallace Bridge and Steel Company, Seattle, has an order from the Union Oil Company of Calif., (headquarters Los Angeles), for a steel barge of 2550 barrels capacity for delivery of distillates in bulk to Puget Sound stations.

KEEL LAYINGS

Halibut boat for Lars Voge by Prince Rupert Drydock & Shipyard, May 1; boat for Gammon & Watts, May 31; scow for Rupert Marine Products Co.

Carfloat for Lehigh Valley Railroad by Federal Shipbuilding & Drydock Co., May 10.

Six steel barges for U. S. Army Engineers by Howard Shipyards & Dock Co., during May.

Wharf boat for City of Dubuque, Iowa, by Marietta Manufacturing Co., May 11; wharf boat for Minneapolis, May 26; wharf boat for St. Paul, May 30.

Barge for Merritt, Chapman & Scott Corp., by Newport News Shipbuilding & Drydock Co., May 5.

Colonial Beacon, motor barge for Beacon Oil Co., by Sun Shipbuilding Company, Mar. 7; motor tanker for Sun Oil Co., May 2.

Two steel barges for W. C. Kelly Barge Line by Charles Ward Engineering Works, Apr. 22 and May 13; F. H. Hilliard, diesel powered sternwheel survey boat for Mississippi River Comm., June 2.

LAUNCHINGS

Halibut fishing boat for P. Bruno by Prince Rupert Drydock & Shipyard, May 30.

Saskatoon, package freight for Canada Steamship Lines by Midland Shipbuilding Co., June 8.

Wabash, carferry for Wabash Ry. Co. by Toledo Shipbuilding Co., Mar. 19.

Above is a view of the diesel-electric ferryboat Golden Bear. This boat is the first of three to be built by the General Engineering & Drydock Company for the Golden Gate Ferry Company, San Francisco, for their San Francisco-Berkeley service. They are 240 feet between perpendiculars, 44 feet beam, 11 feet 6 inches loaded draft. Ingersoll-Rand engines connected to Westinghouse generators supply power sufficient for 11 knots speed.

DELIVERIES

Stockton, diesel-electric ferryboat for Southern Pacific Company by Bethlehem Shipbuilding Corp., May 26.

Tow barge for Union Oil Co. by Hanlon Drydock & Shipbuilding Co., May 14.

Three steel motor patrol boats for U. S. Coast Guard, Washington, D. C., by American Brown Boveri Electric Corp., in May.

H. F. Harvey, bulk freighter for Pittsburgh Steamship Co. by Great Lakes Engineeer Works, May 14.

City of Hamilton, package freighter for Canada Steamships, Ltd., by Midland Shipbuilding Co., May 23.

Iroquois, passenger and freight steamship for Clyde Steamship Co. by Newport News Shipbuilding and Drydock Co., May 12.

Peter Stuyvesant, steel single-screw day steamer for Hudson River Day Line by The Pusey & Jones Corp., May 22.

Tydol, twin screw motor tank barge for Tidewater Oil Co. by The Sun Shipbuilding Co., May 7.

Two steel barges for W. C. Kelly Barge Line by The Charles Ward Engineering Works, June 1.

Golden Bear, diesel-electric ferryboat to Golden Gate Ferry Co. by General Engineering & Drydock Co., in June.

REPAIRS

Todd Dry Docks, Inc., Seattle, is engaged in repairs to the French Line steamer Arkansas which collided on June 3 with the Transmarine Line steamer Suremico off Cape Flattery. Repairs consist of replacing approximately 40 plates and 18 frames and will cost over $83,000.

This yard was also successful bidder for repairs to the steamer Suremico on a bid of $92,760. Sixty plates will be replaced on this vessel.

Craig Shipbuilding Company, Long Beach, Calif., will perform repairs to the steamer Samoa which was damaged in collision with the steamer Coos Bay recently.

The Coos Bay was also badly damaged, having a twisted stern and other damage about the bow.

Morse Dry Dock and Repair Company, Brooklyn, N. Y., will perform damage repairs to the steamship Malolo, which they estimate will be in the neighborhood of $300,000 to $500,000.

This yard also has the freighter Jacob Christensen on dock for repairs to her bow, which was badly damaged when she rammed the Malolo. Repairs to the vessel will cost $23,000.

News from the Shipyards

The Baker Construction Company of Portland is now engaged in the construction of three fireboats for the City of Portland to cost $97,000 each and to be powered with Winton gasoline engines, which have already been ordered.

The Terminal Boat Works at San Pedro recently launched a 125-foot fishing boat for S. Tani, San Pedro fisherman.

We learn from eastern dispatches that the plant and properties of the Wm. Cramp & Sons Ship & Engine Building Company, which have for so many years been devoted to marine construction and repair work have been authorized for sale. The properties to be offered for sale include the Kensington dry-dock, with repair and yard facilities, and Petty's Island opposite their Philadelphia yard.

The Cramp Company announced recently that, due to the lack of shipbuilding business in America, they would abandon their shipbuilding business and devote their plant and capital to the development of certain subsidiaries which embraced fields of industry other than shipping.

The Alaska Steamship Company of Seattle recently put into service between Seattle and ports of Alaska the

(Continued on Page 348)

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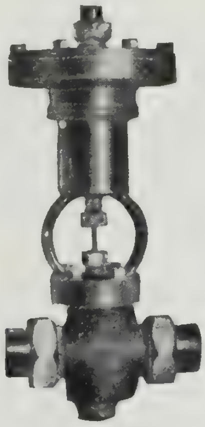

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Progress of Construction

Pacific Coast

BALLARD MARINE RAILWAY CO., INC.,
Seattle, Wash.

Mary Lou, hull No. J 83, cannery tender for Geo. T. Myers & Co., Seattle; 70 L.B.P.; diesel engs.

D. F. No. 2 hull J 84, house scow for Doremus Fisheries, Seattle; 75'x24'x6'.

A. F. Rich, hull J 85, cannery tender for New England Fish Co., Vancouver, B.C.; 70 B.L.P.; diesel engs.

O. M. Arnold, hull J 85, cannery tender, sister to above.

Saretta, hull J 86, tug for Hawaiian Dredging Co., Honolulu; 60 L.B.P.; diesel engs.

Lita, hull J 87, messenger boat for Hawaiian Dredging Co., Honolulu; 30 L.B.P.; gas eng.

Not named, hull J 88, whaler for Paul A. Umoff, Seattle; 28 L.B.P.; gas eng

Not named, hull J 89, yacht for E. Michelsen, Seattle; 44 L.B.P.; diesel eng.

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT
Potrero Works, San Francisco

Purchasing Agent: O W Streett

Stockton, hull 5332, double - end diesel electric vehicular ferryboat for Southern Pacific Co., San Francisco; 256' L.O.A.; 44'10" beam; 19' depth; four Nelseco diesel engines 450 H.P each; keel Nov. 20/26; launched March 5/27; **delivered May 26/27.**

Mendocino, hull 5333, for Northwestern Pacific Railroad, sister to above; keel Jan. 20/27; launched Apr. 14/27; deliver June 10/27 est.

Seven steel dredge hulls for U. S. Smelting & Refining Co., Oakland, Calif.; 140 ft. long; 10 cu. yards capacity.

GENERAL ENGINEERING & DRY-DOCK CO.,
Alameda, California

Purchasing Agent: Al. Wanner.

Golden Bear, hull 3, diesel-electric wooden auto ferry for Golden Gate Ferry Co.; 240' L.B.P.; 44' beam; 11' 6" loaded draft; 13 knots speed; 3-400 B.H.P. Ingersoll-Rand diesel engines, direct connected to Westinghouse generators; keel Oct. 28/26; launched Feb. 2/27; **delivered June/27.**

Golden Poppy, hull 4, sister to above; keel Nov. 22/26; launched Apr. 2/27.

Golden Shore, hull 5, sister to above; keel Feb. 4/27; launched Apr. 30/27.

Santa Rosa, hull 6, diesel-electric, steel automobile ferryboat for Southern Pacific Co.; 236' L.B.P.; 44' 10" beam; 12' 6" loaded draft; 13 knots speed; 4-450 B.H.P. Nelseco diesel engs. connected to General Electric generators; keel Oct. 28/26; launched Mar. 17/27.

J. C. JOHNSON'S SHIPYARD
Port Blakely, Wn.

Hull 95, cannery tender for Sunny Point Packing Co., Seattle; 75 by 17 ft.; launched Apr. 21/27; deliver May 5/27 est.

Hull 106, cannery tender and towboat for Sunny Point Packing Co., Seattle; 75x17 ft.; launched Apr. 21/27; deliver May 5/27 est.

Ruth May, hull 110, trolling boat for Mike Mathison, Port Blakely, Wn.; 45x6x4 ft. 6 in.

Hulls 113-114, two fish scows for Sunny Point Packing Co., Seattle; 62x18x4ft. 6 in.

Hull 116, boat for Thomas Jacobson, Seattle; 64'x 15'x7'4".

HANLON DRYDOCK & SHIP-BUILDING CO.
Oakland, Calif.

Maltha, hull 91, tow barge for Union Oil Co.; 100 L.B.P.; 40 beam; 7ft. 6in. loaded draft; keel Feb. 21/27; launched Apr. 30/27; **delivered May 14/27.**

LOS ANGELES SHIPBUILDING & DRY DOCK CORPORATION
San Pedro, Calif.

Barge No. 1, hull 53, oil barge for California & Eastern Oil Co., Los Angeles; 131 L.B.P.; 40 beam; 9-6 loaded draft; 1050 D.W.T.; keel Dec. 27/26.

THE MOORE DRY DOCK COMPANY
Oakland, California.

Secretary and Purchasing Agent, Nat Levy.

Lake Tahoe, hull 172, diesel-electric, steel, vehicular ferryboat for Southern Pacific Company; 236' L.B.P.; 44'10" beam 12'6" loaded draft; 13 knots speed; 1250 S.H.P. Nelseco diesel engs.; connected to Westinghouse generators; keel Dec. 8/26; launched March 23/27; **delivered June 8/27.**

Redwood Empire, hull 173, sister to above; keel Dec. 8/26; launched Apr. 30/27; deliver July 15/27 est.

Hull 174, steel carfloat for Southern Pacific Co.; 258 by 38 by 7' 9" loaded draft; 14 cars capacity; **keel June 20/27.**

PACIFIC COAST ENGINEERING CO.
Oakland, Calif.

Alki, hull No. 4, fireboat for City of Seattle; 123 L.O.A.; 26 molded beam; 7' 6" draft; 14 knots speed; seven 6-cyl. 300-H.P. Winton diesel engs.

R. W. Atkinson, hull No. 5, dipper dredge hull for Hawaiian Dredging Co., Honolulu; launch June 23/27 est.

PRINCE RUPERT DRYDOCK AND SHIPYARD
Prince Rupert, B.C.

Seine fishing boat for Gammon & Watts; 64 ft. long; keel March 1/27.

Halibut fishing boat for P. Bruno; 54 ft. long; keel Apr. 1/27; **launched May 30/27.**

Halibut boat for Lars Voge; 61 ft. long; **keel May 1/27.**

Fishing boat for Gammon & Watt; 54' long; **keel May 31/27.**

Scow for Rupert Marine Products Co., 58x22x4' 6". **keel laid.**

W. F. STONE & SON
Oakland, Calif.

Purchasing Agent: Lester Stone.

No name, motor cruiser, for stock, 36x10x3½ ft.; 12 mi. speed; 65-HP. gas engines.

Aloha, hull 828, yacht for Frank B. Drake; 55 L.B.P.; 13 beam; 6 loaded draft; **7 mi. speed;** 30 I.H.P. gas eng.; keel Aug. 25/26 deliver May 1/27 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

30 coal barges for Carnegie Steel Co.; 175x26x 11 ft.; **20 delivered.**

Five barges for Rodgers Sand Co.; 135x27x 7ft. 6in.; deliver June 4/27 est.

Five sand barges for J. K. Davison & Bro.; 135' x27'x7'6".

Thirteen barges for Mississippi River Commission, Memphis; 130'x30'x7'6".

Ten covered barges for Inland Waterways Corp., Washington, D.C.; 126'x33'x7'6".

AMERICAN BROWN-BOVERI ELECTRIC CORP.
Camden, N. J.

Purchasing Agent: L. G. Buckwalter

Hull 349, steel motor patrol boat for U. S. Coast Guard, Washington, D.C.; 125 L. O. A.; 23'6" molded beam; 220 tons displacement; Winton diesel engs.; keel Feb. 1/27; **delivered May/27.**

Hull 350, same as above; keel Feb./27; **delivered May/27.**

Hull 351, same as above; keel Feb./27; **delivered May/27.**

Hull 371, carfloat for Pennsylvania R.R. Co.; 185'x34'x9'6". keel June /27 est.

Hull 372, same as above; keel June /27 est.

WM. CORNFOOT, President GEO. RODGERS, Sec'y-Treas.

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In American Shipyards

THE AMERICAN SHIP BUILDING COMPANY

Cleveland, Ohio.

Purchasing Agent: C H Hirsching.

Carl D. Bradley, hull 797, self-unloading bulk freighter for Bradley Transport. Co.; 615 L.B.P.; 65 beam; 20 loaded draft; 14 mi. speed; 13,000 D.W.T.; turbo-electric drive; 4000 I.H.P.; 2 water tube boilers; 325 lbs. pressure; keel Jan. 10/27; launched Apr. 9/27; deliver July 1/27 est.

Harry Coulby, hull 798, bulk freighter for Pickands, Mather & Co.; 607' L.B.P.; 65' beam; 33' loaded draft; 13 mi. speed; 13,800 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 B & W. boilers; 200 lbs. pressure; keel Feb. 7/27; **launched Apr. 30/27;** deliver July 1/27 est.

Not named, hull 799, tug for Michigan Limestone & Chemical Co., 83'6" L.B.P.; 24 beam; 12 draft; 12 mi. speed; compound engs. 900 I.H.P.; 1 fire tube boiler, 160 lbs. pressure; keel Mar. 1/27 est.; launch Apr. 9/27 est.; deliver May 1/27 est.

Not named, hull 800, bulk oil barge for Standard Transportation Co.; 258 L.B.P.; 40 beam; 10 draft; keel Mar. 21/27 est.; launch July 13/27 est.; deliver July 27/27 est.

Not named, hull 801, oil barge for Standard Transportation Co., sister to above; keel Mar. 21/27 est.; launch July 13/27 est.; deliver July 27/27 est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT

Quincy, Mass.

Lexington, hull 1300, airplane-carrier U.S.N., launched Oct. 3/25.

Hull 1402, carfloat, N.Y., N.H. & Hartford R.R.; 360'x40'x11'6"; 1375 gro. tons; keel July 14/26.

Hull 1403, carfloat, same as above; keel July 15/26.

Hull 1404, carfloat, same as above; keel July 16/26.

Hull 1405, carfloat, same as above; keel July 16/26.

Hull 1406, oil barge for City Service Transport Co. 204'x35'6'x14'3".

CHARLESTON DRY DOCK AND MACHINERY COMPANY

Charleston, S. C.

Purchasing Agent: Charles R. Valk.

One lighter for stock.

CONSOLIDATED SHIPBUILDING CORPORATION

Morris Heights, N. Y.

Hull 2872, cruiser for B. H. Borden; 95 x 16 ft.; 2 Model R Speedway engs., 300 H.P. ea.

Hull 2874, cruiser for Clifford V. Brokaw; 85x 14 ft. 6 in.; 2 Model R. Speedway engs. 300 H. P. each.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.

Philadelphia, Pa.

Purchasing Agent: Ed. C. Geehr.

Malolo, hull 509, express psgr and frt liner, Matson Navigation Co.; 582 LOA; 577 length at water line; 83 ft beam; depth molded to C deck 54 ft.; displacement 22,050 tons; 8250 DWT; speed 22 knots regular, 23 knots maximum; 25,000 shaft horsepower; Cramp-Parsons turbines; oil burning B & W water-tube boilers; keel May 4/25; launched June 26/26.

Yarmouth, hull 518, twin screw passenger and freight steamer for Eastern Steamship Lines; 378 length at water line; 55-6 beam; 29-6 molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears, six single-ended Scotch boilers; keel Feb 23/26; launched Nov 6/26; deliver June 10/27 est.

Evangeline, hull 524, twin screw passenger and **freight steamer for Eastern Steamship Lines; 378 length at water line; 55'6" beam; 29'6" molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears; 6 single-ended Scotch** boilers; keel May 1/26; launched Feb. 12/27; deliver July 1/27 est.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

Purchasing Agent: G. O. Williams.

Comoco, hull 122, steel yacht for R. W. Judson, Detroit; 140' L.B.P.; 23'6" beam; 8'9" loaded draft; 15 mi. speed; 260 D.W.T.; 600 I.H.P. diesel engs.; keel Dec. 15/26; launch May 21/27 est.; deliver June 1/27 est.

Helen, hull 121, steel yacht, for Chas. E. Sorensen, Detroit; 105 L.B.P.; 17' beam; 6' loaded draft; 13 mi. speed; 110 D.W.T.; 200 I.H.P. diesel engs.; keel Nov. 1/26; launch May 24/27 est.

Grathea II., hull 124, yacht for E. T. Strong, Flint, Mich.; 57'x13'x4'; 13 mi. loaded speed; 22 D.W.T.; 200 I.H.P. gas engs.; keel Aug. 1/27 est.. launch and deliver Apr. 1/28 est.

DRAVO CONTRACTING COMPANY

Pittsburgh, Pa.

Hull 502 one steel barge for stock; 230x45x11 ft.; 650 gro. tons.

Hulls 537 and 538, two steel whirler boat hulls for Contracting Dept.; 40x48x5'6"; 100 gro. tons.

Hulls 540-543 inc.; 4 steel barges for Keystone Sand & Supply Co.; 135'x27'x8'; 320 gro. tons ea

Hulls 557-566 inc., 10 steel barges for Mississippi River Commission, Memphis; 120'x30'x7'4"; 430 gro. tons ea

Hulls 577-578, 2 dump scows for Pittsburgh Plate Glass Co.; 110x26x8 ft. 6in.; 220 gro. tons. ea.

Hull 579, steam dredge for Ohio River Gravel Co.; 120 x 32 x 6 ft.; 200 gro. tons.

Hull 580, steel hull "A" frame derrick boat for Pittsburgh Plate Glass Co.; 72 x 34 x 5 ft.; 120 gro. tons.

Hulls 581-590 inc., 10 standard steel barges for stock; 100x26x6 ft. 6 in.; 135 gro. tons each.

Hulls 591-600 inc., 10 standard steel barges for stock, 100x26x6ft. 6in.; 135 gross tons each.

Hulls 601-604 inc., 4 steel barges for Keystone Sand & Supply Co.; 135x27x8ft.; 320 gr. tons ea.

Hulls 605-612 inc., 8 steel barges for Keystone Sand & Supply Co.; 135 x 27 x 8ft.; 320 gr. tons each.

Hull 614, one diesel engine towboat for stock; 110x26x5 ft.; 215 gro. tons.

Hulls 615 and 616, two 120-H.P. stern wheel diesel towboats for stock; 74ft. 2in. x 16 ft. x 4 ft.; 320 gro. tons ea.

Hulls 617 and 618, two steel barges for Ohio River Sand Co.; 130 x 30 x 7 ft. 6 in.; 25 gro. tons ea.

Hulls 621-626 inc., six covered oil barges, steel decks, for International Petroleum Co., Montreal; 100'x30'x6'6"; 180 gro. tons ea.

Hulls 627-631 inc., five floating caissons, for contracting dept.; 39'x18'10"x11'; 77 gro. tons ea.

Hulls 632-634 inc., three complete maneuver hulls for U S. Engineers, Pittsburgh; 93 gro tons ea.

Hulls 635-644 inc., ten covered steel barges for Inland Waterways Corp., Washington, D.C.; 126x 33x7'6"; 485 gro. tons ea.

Hulls 652-653, two steel deck scows for U. S. Engineer Office, Philadelphia; 102x30x10 ft.; 400 gro. tons ea.

DUBUQUE BOAT & BOILER WORKS

Dubuque, Iowa

Purchasing Agent: A. L. Yehger.

Thorpe, river towboat for Upper Mississippi Barge Line Co. & Inland Waterways Corp.; 132'x35' x3'6"; stern wheel, tandem comp. surface condensing engs.; 15"x30"x78" stroke; keel Oct. 1/26 est.; launch Mar. 1/27 est.; deliver Apr. 1/27 est.

Weber, river towboat, sister to above; keel Oct. 1/26 est.; launch Mar. 1/27 est.; deliver Apr. 1/27 est.

Morse, river towboat, sister to above; keel Oct 1/26 est; launch Mar. 1/27 est; deliver Apr. 1/27 est.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY

Kearny, N. J.

Purchasing Agent: R. S. Page.

Dixie, hull 89, passenger and freight steamer **for Southern Pacific Steamship Lines, Pier 49, North River, New York; 427 L.B.P.; 60 beam; 25'6" loaded draft; 6700 D.W.T.; De Laval steam turbines; 7700 S.H.P.; 4 B. & W. boilers, 21,900 sq.** ft. heating surface; 16,000 sq. ft. superheating surface; keel Jan. 31/27.

Hull 90, carfloat for Lehigh Valley Railroad 278x 39x10ft.; keel Apr. 18/27.

Hull 91, same as above; **keel May 10 '27.**

Hull 92, same as above.

Hull 93, carfloat for D. L. & W. Railroad, 278 x39x10ft.

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Hull 94, same as above.

Hull 95, same as above.

Hulls 96-99 inc., four carfloats for the Pennsylvania Railroad.

GREAT LAKES ENGINEERING WORKS

River Rouge, Mich.

Purchasing Agent: Chas. Short.

H.F Harvey, hull 256, bulk freighter for Pittsburgh Steamship Co., Cleveland; 580 L.B.P.; 60 beam, 20 loaded draft; T.E. engs.; 2200 I.H.P.; 3 Scotch boilers 12′ diam. by 11′6″; keel Jan. 3/27; launched Apr. 9/27; **delivered May 14/27.**

St. T. Crapo, hull 256, bulk cement freighter for Huron Transportation Co.; 385 L.B.P.; 60 beam; 19 loaded draft ;11 mi. speed; 7200 D.W.T.; T.E. engs.; 1800 I.H.P.; 3 Scotch boilers, 12 ft. 9 in. diam.; keel April 12/27; launch Aug. 1/27 est.; deliver Oct. 1/27 est.

HOWARD SHIPYARDS & DOCK COMPANY

Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hull 1601, hull for Baton Rouge Car Terminal, Baton Rouge, La.; 285′x60′x9′6″; keel Mar. 30/27; launch June 24/27 est; deliver Aug. 1/27 est.

Hull 1605, steel barge for U. S. Army Engineers, St. Louis; 55x16x3ft.; **keel May 3 27.**

Hull 1606, same as above; **keel May 16/27.**

Hull 1607, same as above; **keel May 16/27.**

Hull 1608, same as above; **keel May 18/27.**

Hull 1609, same as above; **keel May 18/27.**

Hull 1610, same as above; **keel May 27/27.**

MANITOWOC SHIPBUILDING CORPORATION

Manitowoc, Wis.

Purchasing Agent: H. Meyer.

Hull 227, one car ferry for Grand Trunk Milwaukee Car Ferry Co.; 360′ L.O.A.; 58′ molded beam; 21′6″ depth; 2 T.E. engs.; 4 Scotch boilers; launch Jan. 19/27 est.; deliver Mar. 1/27 est.

MARIETTA MANUFACTURING COMPANY

Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Thirty steel discharge pontoons for U.S. Army Engineers, Rock Island, Ill.; 38′x14′x3′2″; 11 launched.

One steel stern-wheel towboat for Magdalena River, Colombia, 168′ x 42′ x 5′; tandem compound engs.; keel laid; deliver July 1/27 est.

Wharf boat for city of Dubuque, Iowa; 214x45x6ft 6in , **keel May 11/27.**

Wharf boat for Minneapolis, 214x45x6ft. 6in ; **keel May 26/27.**

Wharf boat for St. Paul, 214x45x6ft. 6in.; **keel May 30/27.**

Stern-wheel towboat for Magdalena River, Colombia; 168′x42′x5′; keel July 15/27 est.

Sternwheel towboat; sister to above; keel Nov. 1/27 est.

Eight steel hoppered cargo barges for Magdalena River, Colombia; 125′x26′x6′

MIDLAND BARGE COMPANY

Midland, Pa.

Fifteen barges for Inland Waterways Corporation, 126′x33′x7′6″; **15 launched; 14 delivered.**

Four barges for West Virginia Sand & Gravel Co.; 100x26x6ft 6in.; keels May 15/27 est; deliver July 1/27 est.

One dredge hull for River Sand Co.; 131x30x5ft.

One hull for Geo. Martin; 130x32x5ft.

Four sectional dry-docks for International Petroleum Co. of Montreal; 70x44 ft.

One steel flush deck barge for Dillman Egg Case Co.; 180′x36′x7′.

Fifteen cabin barges for Inland Waterways Corp., Washington , D.C.; 126x33x7′6″.

MIDLAND SHIPBUILDING COMPANY, LTD.

Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

City of Hamilton, hull 18, package freighter for Canada Steamships, Ltd.; 230 L.O.A.; 38 beam; 23 depth; T.E. engs.; keel Oct. 11/26; launched Jan. 12/27; **delivered May 23/27.**

City of Montreal, hull 19, package freighter same as above; keel Oct. 11/26; launched Jan. 12/27; deliver June 15/27 est.

Saskatoon, hull 20, package freighter for Canada Steamship Lines, Ltd.; 250 L.B.P.; 42 beam; 26ft. 6in. draft; keel Jan. 18/27; **launched June 8/27;** deliver July 1/27 est.

Weyburn, hull 21, sister to above; keel Jan. 18/27; launch May 18/27 est.

NASHVILLE BRIDGE COMPANY

Nashville, Tenn.

Purchasing Agent: Leo E. Wege.

Hull 108, dredge, owner not named; clam shell bucket type; 110′x51′6″x8′; steam eng.; keel June 15/27 est.

Hulls 113 to 118 inc., deck barges for stock; **6 keels laid; 2 delivered.**

Hull 119 deck barge, for stock; 130x34x8 ft.; keel Apr. 27/27; launch May/27 est.

Hull 120, deck barge, for stock; 130x34x8 ft.; deliver June 20/27 est.

Hull 121, deck barge for stock; 140 L.B.P.; 32 beam; 6 loaded draft; keel June 15/27 est.; deliver Aug. 1/27 est.

Hull 122, deck barge same as above; keel June 15/27 est.

Hull 123, deck barge same as above; keel June 15/27 est.

Hulls 124-127 inc., four deck barges for stock; 130x32x8ft.; deliver Oct. 15/27 est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas: Plummer, 233 Broadway New York City.

Iroquois, hull 306, passenger and freight **steamship for Clyde Steamship Company, New York, 407′-3″ overall, 62′-0″ beam, 30′-6″ depth, Newport News turbines and gear;** 8500 I.H.P.; Scocth boilers; oil burning; keel March 20/26; launched Dec. 11/26; **delivered May 12/27.**

Shawnee, hull 307, sister to above; **keel May** 15/26; launched April 18/27; deliver July/27 est.

California, hull 315, 18-knot, passenger liner **for Panama Pacific Line, New York; 600 ft. long, 80 ft. beam, 52 ft. depth; watertube boilers for oil 22,000 gross tons; 17,000 I.H.P.; keel Mar. 20/26;** launch Oct./27 est.

Caracas, hull 319, passenger and freight steamer for Red D Line, New York; 335′4″ L.O.A.; 51′ beam; 22′ draft; Newport News turbines and gears; water-tube boilers; 3560 D.W.T.; 4000 S.H.P.; keel Nov. 18/26; launch June/27 est.

Hull 321, barge for Merritt, Chapman and Scott Corp.; 154x50x13ft.; **keel May 5/27.**

THE PUSEY AND JONES CORP.

Wilmington, Del.

Purchasing Agent: James Bradford.

Not named, hull 1031, single screw passenger **freight steamer for Baltimore & Philadelphia Steamboat Co., Philadelphia; 219 L.B.P.; 45 beam; 11 loaded draft; 14½ mi speed; 4 crank, TE engs. 21-32-35-35 by 24″; two B. & W. water-tube** boilers, 3046 sq. ft. heating surface each.

Peter Stuyvesant, hull 1033, steel single screw day steamer for Hudson River Day Line, New York; 252 L.B.P.; 46 beam; 4-cycle, triple expansion engs.; 2800 I.H.P.; 4 B. & W. water-tube boilers; 11x12 200 lbs. pressure; keel Sept. 15/26; launched Feb. 2/27; **delivered May 22/27.**

Not named, hull 1034, steel twin-screw diesel yacht from Henry J. Gielow, Inc., naval architect, New York, 294′ L.O.A.; 38′3″ beam; 16′ loaded draft; 2 Bessemer diesel engs.; total of 3000 H.P.; keel Apr. 1/27; launch July 15/27 est.; deliver Jan. 1/28 est.

STATEN ISLAND SHIPBUILDING COMPANY

Mariner's Harbor, N. Y.

Purchasing agent: R. C. Miller.

Socony 1, hull 774, steam tug for Standard Transportation Co.; 100 ft. 2 in. L. B.P.; 24ft. 1in. beam; 12ft. 3in. depth; 15 knots speed; comp. engs. 850 I.H.P.; 1 Scotch boiler 14ft. 9in. dia. by 12ft.; keel Mar. 8/27; launch June 7/27 est.; deliver Aug. /27 est.

Socony 5, hull 775, steam tug, sister to above; keel Mar. 15/27; launch June 21/27 est.

Hulls 777-780, four caissons for The Foundation Co. for Lower Hackensack Bridge, New Jersey; steel working chambers and timber construction; **3 delivered.**

SUN SHIPBUILDING COMPANY

Chester, Penn.

Purchasing Agent: H. W. Scott.

Tydol, hull 103, twin screw motor tank barge for Tidewater Oil Co.; **252′ long; 40′ beam;** 14′ depth; to carry 1885 tons on 12′ draft; 10 kts. speed; keel Jan. 3/27; **launched Apr. 14/27; delivered May 7/27.**

Not named, hull 104, single screw bulk oil steamer for Tidewater Oil Co.; 480′ long; 65′9″ beam, 37 feet depth; to carry 13,000 tons on 27′6″ draft; speed 11½ knots; keel March 1/27; launch Aug. 15/27 est.

Colonial Beacon, hull 105, motor barge for Beacon Oil Co., Boston; 255′6″x40′x15′; two 360 H.P. Fairbanks-Morse diesel engs.; **keel laid Mar. 7/27.**

Not named, hull 106, motor tanker for Sun Oil Co.; 480′x65′9″x37′; 13,000 D.W.T.; 2800 S. H.P. at 80 R.P.M.; 4 cyl., 2-cycle Sun Doxford engs.; **keel May 2/27.**

Not named, hull 107, tanker for California Petroleum Co.; 510′x70′x40′. 17,000 D.W.T.; 4500 S. H. P. at 82 R.P.M., 8-cyl, 2-cycle Sun-Doxford eng.

Hull 108, carfloat for Pennsylvania Railroad; 330′x38′x10′6″.

Hull 109, same as above.

TOLEDO SHIPBUILDING CO.

Toledo, Ohio.

Purchasing Agent: Otto Hall.

Wabash, hull 177, car ferry for Wabash Ry. Co.; 388 L.B.P.; 57′6″ beam; 16′ loaded draft; 13½ mi. speed; 2500 D.W.T.; T.E. engs.; 2500 I.H.P.; 4 Scotch boilers, 14′6″ diam.; keel Nov. /26; **launched Mar. 19/27;** deliver Apr. /27 est.

B. F. Affleck, freighter, hull 178, for Pittsburgh Steamship Co.; 580 L.B.P.; 60′ beam; 19′ loaded draft; 12½ mi. speed; 12,500 D.W.T.; T.E. engs.; 2500 I.H.P.; 3 Scotch boilers; 14′ diam; keel Feb. 1/27; launch June 25/27 est.; deliver July 30/27 est.

TODD DRYDOCK & ENGINEERING REPAIR CORP.

Brooklyn, N. Y.

Purchasing Agent: H. J. Shannon.

No name, hull 40, diesel-electric ferryboat for Dept. of Plant & Structures, City of New York; 101 ft. 6 in. length over guards; 27 ft. 7 in. beam; 6 ft. 8¾ in. loaded draft; 300 I.H.P. Nelseco diesel engine; keel Apr. 14/27.

No name, hull 41, diesel-electric ferryboat, sister to above; keel Apr. 14/27.

THE CHARLES WARD ENGINEERING WORKS

Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Hull 55, steel barge for W. C. Kelly Barge Line; keel Jan. 3/27; launched March 13/27.

Hull 56, same as above; keel Mar. 7/27; launched April 20/27; **delivered June 1/27.**

Hull 57, same as above; keel Mar. 22/27; launched May 9/27; **delivered June 1/27.**

Hull 58, same as above; **keel Apr. 22/27.**

Hull 59, same as above; **keel May 13/27.**

W. A. Shepard, hull 60, towboat for W. C. Kelly Barge Line; screw propeller, 2 Fairbanks-Morse diesel engs.; 720 B.H.P.; keel Sept. 23/26; launched Jan. 11/27.

Duncan Bruce, hull 61, **stern-wheel towboat, for W. C. Kelly Barge Line; 135′x35′x6′; Fairbanks-**Morse diesel engs.; keel Jan. 17/27; launched May 2/27.

F. H. Hilliard, hull 62, diesel powered stern wheel survey boat for Mississippi River Comm., Dredging Dist., Memphis Tenn.; 139′6″x24′x5′3″; **keel June 2/27.**

Repairs

BETHLEHEM SHIPBUILDING CORP., UNION PLANT

Potrero Works, San Francisco

Drydock, paint, misc. repairs: Eldorado, Washington, Redline, Edna Christenson, Point Bonita, tug Governor Irwin, Nevadan, Floridian, Coos Bay, West Farallon, Nebraskan, Barge No. 93, U.S. mine planter Col. Geo. Armistead, Point Arena, F. H. Hillman, H. T. Harper, J. A. Moffett San Pedro, Mericos H. Whittier, President McKinley, Admiral Peary, West Chopaka, Cascade, Willapa, Prentiss, Washington, Philippine, Dilworth. Furnish and install oil burners: Admiral Benson, Admiral Peoples. Tail shaft repairs: La Placentia Redline. Pipe repairs: W. L. Steed, Lewis Luckenbach, Newport. Furnish and install 20 lengths of cargo piping: Crampton Anderson. Misc. repairs: R. H. Hanna, Oaxaca, Shreveport, Pennsylvanian, Columbian, Lurline, Manchuria, Dakotan, Lubrico, Makura, Mexi-

View of the deck above the chart room on the S. S. Leviathan, flagship of the U. S. Lines, showing enclosed loop of the RCA Radio Direction Finder.

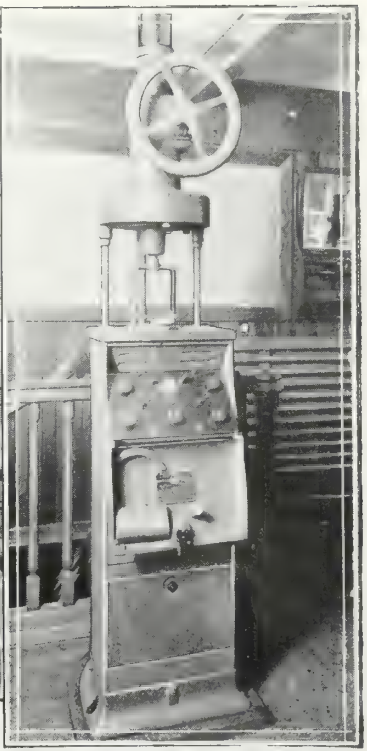

Chart room view of the RCA Radio Direction Finder showing control panel.

The S.S. Leviathan installs an RCA Radio Direction Finder

RECENTLY an RCA Radio Direction Finder was installed on the S.S. Leviathan. This new installation, added to the present radio equipment, makes the Leviathan prepared to meet any normal or emergency radio situation which might arise.

The accuracy, simplicity and speed with which the RCA Radio Direction Finder gives true bearings have won the enthusiastic appreciation of the officers of the Leviathan. The captains of more than 300 ships equipped with RCA Radio Direction Finders are strong in their praise of its dependability and all around excellence.

We will be glad to take up with you in detail just how the RCA Radio Direction Finder will afford your ships greater safety and speed up running schedules between ports. Or write for our letter P-7 which outlines sixteen distinctive features of the RCA Radio Direction Finder.

RCA Radio Direction Finder proves itself invaluable in Malolo collision

Immediately after the S. S. Malolo was rammed by the S. S. Jakob Christensen, a radio message for help was broadcast. The Tanker Gulfland answered. She was thirty-eight miles away. Her bearing was observed on the Malolo's RCA Radio Direction Finder and she was given a course to steer.

Messages were sent to the Merritt Chapman Company at New York requesting tugs and to the Coast Guard Base at New London for cutters. The trawler Fisher reported her position nearby and was given a course to steer. The bearings of the destroyer Shaw and the S. S. City of Pretoria were also taken on the Malolo's RCA Radio Direction Finder and these vessels, too, were also given true courses to steer that brought them up to the Malolo through the fog. The direction finder was also used to guide the wrecking tugs as soon as they came within range. Without it the tugs might have been unable to find the Malolo until the fog lifted. One of them was passing several miles away when the Malolo took a bearing on her and straightened her out on a new course. Thus the great value and extreme accuracy of this latest and greatest aid to navigation was again strikingly demonstrated.

RCA

MARINE RADIO

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NORFOLK, VA.

PHILADELPHIA
SAN FRANCISCO
LOS ANGELES
CLEVELAND
SEATTLE
GALVESTON
HONOLULU, T. H.

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can, F. A. Douty, Californian, Hauraki, Port Saunders, Missoula, Cathwood, Lockgoil, Mongolia, Kansan, Laurel, Arizonan, Oregonian J. C. Fitzsimmons, Winamac, Yacht Casiana, Hycania, La Brea, Trontolite, Charlie Watson, Tamaha, Point Arena, R. W. Stewart, Rigi, Regulus, tug Sea Witch, tug Restless, Empire Arrow, Storstad, Kekoskee, Willkeno, San Fernando, George W. Barnes, El Oso, Willpolo, Bearport, Martha Beuhner Enterprise, Cascase, Prentiss, Bearport, H. W. Baxter.

CHARLESTON DRY DOCK AND MACHINERY CO.,

Charleston, S. C.

Clean and paint, stmr. Fluor Spar. New tail shaft; Cecelia. Drydock, seasonal repairs: Robert H. Locknard, Palmetto.

COMMERCIAL IRON WORKS,

Portland, Ore.

Drydock and voyage repairs: West Nomenten, West Niger. Drydock and general overhaul: dredge Clatsop (cost $10,350). Voyage repairs: West Holbrook, West O'Rowa.

CRAIG SHIPBUILDING CO.,

Long Beach, Calif.

Drydock and fitting out: yacht Goodwill. Drydock and hull repairs: dredge Turbine, yacht Samoa. Drydock and inspection: whaler Diomed. Drydock, yacht Seaward.

GENERAL ENGINEERING AND DRY DOCK COMPANY,

Alameda, Calif.

Drydock, clean, paint, misc. repairs: Santa Rosa (put on wheels), Golden West, Unimak, yacht Alma, Golden Gate, Motormates, tug Sea Scout (new guards, putting on new stem) Golden State (damage repairs), Bangor, Golden Dawn (install new propeller blades and new tail shaft). Took down yards and gallant topmasts: schr. Star of Italy. General repairs: Coos Bay Lumber Co. barge. Drydock, straighten plates, remove some plates, general repairs: barge Pineapple. Minor repairs: Mayfair, Viking. Vessels listed last month still undergoing repairs: Coquina, Vanguard, Idaho.

HANLON DRYDOCK & SHIPBUILDING CO.,

Oakland, Calif.

Drydock and overhaul: Stockton, Lake Miraflores, T. A. Earner, West Henshaw, Port Angeles, Boobyalla. New tail shaft: Salina.

MOORE DRY DOCK COMPANY,

Oakland, Calif.

Drydock, clean, paint, misc. hull and engine repairs: Siskiyou, Caddopeak, Elizabeth (also deck and boiler repairs), T. C. Walker (also boiler repairs). Drydock, clean, paint, misc. hull and rudder repairs: Margaret Dollar, Sinaloa, Dauntless (also engine repairs) West Cajoot (also propeller repairs), Venezuela (also tail shaft and bearing repairs). Dock, clean, paint: Monterey, Santa Fe Barge No. 5, Ryder Hanify. Dock, clean, paint, misc. hull repairs: Santa Barbara, Westport. Dock, clean, paint, overhaul sea valves: Star of Italy. Dock, clean, paint, install new wheel: Hercules. Dock, clean, paint, repair valves and strainers also misc. repairs: S. O. Barge No. 4. Dock, misc. hull and deck repairs: E. M. Phelps (also boiler repairs), Jas. B. Duke (redwood stern bearing and refit tube). Misc. deck and engine repairs, also overhaul pump. Sinaloa, Misc. repairs: Salina, Santa Fe Barge No. 5, West Handshaw. Stockton, Marie Bakke, Coos Bay, Frances, Dauntless, Edward T. Jefferey (also mach. propellers), Virgil G. Bogue (also mach. propellers).

U. S. NAVY YARD

Bremerton, Wash.

Drydock and misc. repairs: Tennessee, Reno, Sinclair. Misc. repairs. New Mexico, McDermot Misc. repairs incidental to operation as district craft: Mahopac, Swallow Challenge, Pawtucket, Sotoyomo, Tatnuck.

TODD DRY DOCKS, INC.,

Harbor Island, Seattle, Wash.

Drydock, clean, paint: Aleutian (new), Cuzco (misc. repairs), Donna Lane, tug Forest T. Crosby, Victoria Drydock, change propeller: Lakina. Engine and boiler repairs H. F. Alexander. Dock, misc. repairs: barge Success. Misc. repairs: Marie Bakke, Border Queen, City of Bellingham, Margaret Dollar, Munmo, Olympic, President Taft, tug Prosper, Tacoma, Willpolo

VICTORIA MACHINERY DEPOT CO., Ltd., Victoria, B. C.

Dock, clean, paint hull engine, and deck repairs C. G. S. Givenchy, Nootka (also install new cargo storage tanks), stmr Black, White, Princess Maquinna, Canadian Transporter, Princess Mary, Wm Grant. Drydock, clean, paint, general overhaul, launch Thistle. Dock, clean, paint, tail shaft and propeller repairs stmr Otter, Princess Patricia (also boiler repairs), Princess Royal (also hull and deck repairs), Blue, Brown, Green, Berwin. Dock, clean, paint, hull repairs yacht Saturna, Island Princess. Dock, clean paint Des Brisay. Boiler repairs: tug Superior, stmr Forager (renew furnaces), tug Swell. Deck repairs: Can. Pac. Ry. scow. Make and install new funnel stmrs Blue, White. Make and install large elevator Princess Adelaide.

Malolo

(Continued from Page 315.)

practically a derelict, it being impossible to get steam. The 50-horsepower diesel emergency set was started immediately after the accident and operated 100 per cent, giving power for lights, for the radio, and for some heating. The radio got in touch with Merritt, Chapman & Scott at New York, requesting tugs, and with the Coast Guard base at New London asking that cutters be sent out. The first ship to respond to radio was the tanker Gulfland, who advised that she was about 38 miles away. Her bearing was observed on the Malolo's direction finder and she was given a course to steer. Shortly afterwards a steam trawler, Fisher, reported herself close by and came into contact. This trawler stood by and blew three whistles at regular intervals to warn approaching ships. Before the night was over the destroyer Shaw, the tanker Gulfland, and the freighter City of Pretoria in ballast were standing by.

The crew and passengers aboard the Malolo were taking their misfortune in good part. There was no suggestion of anything like fright or panic. It is said that the black gang (or should it be white gang on an oil burning steamer?) from the fire room came out through the door in the bulkhead singing "Sweet Adeline." There was considerable feeling of depression, of course, and much expression of regret at the sudden termination of what had promised to be a very successful and enjoyable sea trial. The greatest hardship came about from the fact that there was no possibility of getting fire in the galley. Late in the afternoon, under the leadership of Captain Saunders, emergency wiring was fitted up to the electric fan in the draft over the charcoal burner. No charcoal being available, several hardwood gratings were sacrificed, and by the next morning everybody had a hot meal.

At 2 p. m. on Thursday, the first towboat hove in sight and, another appearing about an hour later, lines were gotten aboard and these two tugs started the Malolo to New York at 3:45 on that afternoon. On Friday morning, about 7 o'clock, two more tugs were available, and, arranged double tandem, they got the Malolo into New York early Saturday morning.

On survey it was found that the injury to the hull was practically all below the water line. The repairing of this injury will delay the delivery of the vessel for a month or six weeks, and in that respect the accident is very unfortunate from the operator's standpoint, as the Malolo had practically been sold out for her maiden voyage on a definitely dated schedule. On the other hand, from the standpoint of the shipbuilder and the naval architect, this accident has demonstrated that the Malolo, built to completely comply with the requirements of the International Convention for Safety of Life at Sea, is probably the safest vessel afloat. Several much larger liners, subjected to practically the same injury, have sunk in a very few minutes with great loss of life. The Malolo, with 7000 tons of water in her fire rooms, was to all intents and purposes as safe as before the accident happened so far as flotation was concerned.

SHIPBUILDING

(Continued from Page 343)

steamship Aleutian, purchased from the Panama Railroad Company and practically entirely refitted at the steamship company's pier at Seattle. The Aleutian is 375 feet long, 50 feet beam, and has a displacement of 8250 tons loaded. She has oil-burning boilers, reciprocating steam engines, and twin screws. Accommodations built into the ship include 122 outside rooms for first cabin passengers, 22 having private baths. A large dining room has been provided and all public rooms have been furnished with every comfort for the passenger touring the Canadian and Alaska Coast. Refrigerated cargo space for 100 tons of perishables has been included in her cargo facilities.

NEW PORTLAND FERRYBOAT

Reports from Portland, Oregon, say that the County Commissioners of Multnomah will soon call for bids on the hull and engine of a new ferryboat for trans - Willamette River operation. The craft is to be 145 feet long, have a beam of 44 feet, and powered with a 250-horsepower diesel engine and capacity for 50 automobiles.

The Engineering Section of the Los Angeles Harbor Department will retire from all shipbuilding activities. The Board has authorized bids to be called for the lease of the city's marine ways. It is reported that Park & Kibele will bid on this plant as a much needed extension to their ship repair plant.

Trade and Traffic Trends

United States Needs Cargo Liners

An Adequate Merchant Marine an Indispensable Factor in the Expansion of Our Foreign Trade and for National Security

By Alfred H. Haag, Dean of Shipping Courses, School of Foreign Service, Georgetown University

PROBABLY the most vital issue confronting the American people today is the much-discussed shipping problem.

The apparent lack of appreciation on the part of the American people of this issue is primarily due to the insidious propaganda that is and has been waged against any move toward the establishment of a permanent and adequate merchant marine owned, controlled, and operated by the American people. It is high time that they realize that most articles which have been published opposing the upbuilding of our merchant marine are nothing more or less than artful foreign propaganda.

American ships of commerce are an economic necessity, and an indispensable factor as an auxiliary to our navy in times of national emergency.

It is inconceivable that the richest nation in the world, with a wealth of 400 billion dollars and an international trade of almost 10 billion dollars annually, with freight revenues for transporting this trade amounting to 600 million dollars per annum, cannot support a merchant marine of the best equipped and most suitable types of vessels sufficient to carry the greater portion of its commerce. The fact is that today 70 per cent of our international trade is carried in foreign flag ships.

Flag waving arguments have no effect in influencing American shippers to use American flag ships and will have none until such time as our flag waves from the ensign staff of a ship offering the same advantages in speed, regularity, and frequency of sailings as that offered by our competitors. Not until that time can we be assured of the full support of American shippers; nor is it fair or reasonable for us to expect them to accept inferior commercial service under the guise of patriotism.

The postwar trend has been toward cargo liner service; this is, a port to port service, in contradistinction to tramp service; and this service now represents 75 per cent of the world's merchant tonnage. Our competitors were quick to recognize this trend and have either built or acquired modern tonnage with increased speeds and other economic advantages, so that today we are far behind in this respect.

Need for Modern Vessels

During the period from 1921 to 1926, the principal maritime nations built for transoceanic service vessels of 2000 gross tons and over, totalling approximately as follows:

Country	No. of Vessels	Gross Tons
Great Britain	600	3,500,000
Germany	172	950,000
Italy	63	506,000
France	72	450,000
Japan	52	250,000
United States	14	137,000
Total	973	5,793,000

Or for every single ship of this class that the United States has built, Great Britain has approximately 42; Germany 12; France 5; Italy 4; and Japan 4.

Of ships building or contracted for at the present time, of the same class and service, the records disclose the following:

Country	No. of Vessels	Gross Tons
Great Britain	142	980,000
Germany	49	395,000
Italy	28	300,000
Japan	19	100,000
United States	4	63,000
France	8	58,000
Total	250	1,896,000

Or for every single ship of this class that the United States is building or has contracted for at the present time Great Britain has 35; Germany 12; Italy 7; Japan 5; and France 2.

Speed of Ships

Another striking comparison is in the number and speed of vessels, suitable for transoceanic service, registered under the flag of the principal maritime nations.

Ships of 12 knots and over:

Great Britain	1280
France	277
United States	234
Japan	206
Italy	185
Germany	153

In this class we rank third being outclassed by our principal competitor, Great Britain five to one.

Ships of 14 knots and over:

Great Britain	435
France	105
United States	100
Japan	56
Italy	54
Germany	29

We rank third in this class being outnumbered by Great Britain four to one.

Ships of 16 knots and over:

Great Britain	145
France	55
United States	36
Italy	26
Japan	10
Germany	9

Here we rank third, Great Britain outclassing us about four to one.

Ships of 18 knots and over:

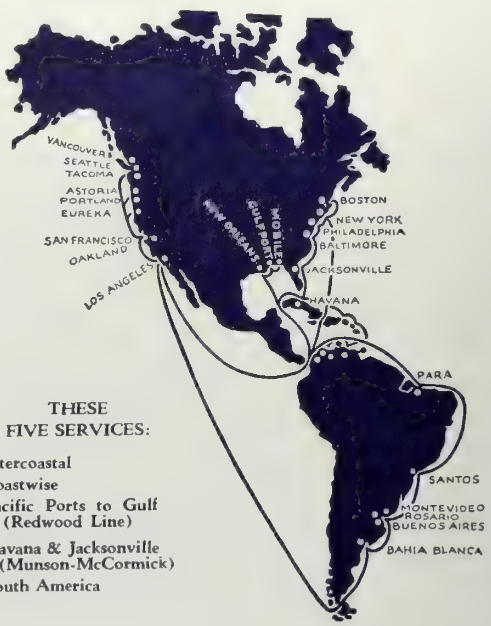
Great Britain	38
France	19
Italy	9
United States	5
Japan	2
Germany	2

Four more ships for the Intercoastal Service

TO KEEP PACE with the demand, four more 7800 ton freighters have been added to the Munson-McCormick Intercoastal Service. These four ships: S.S. Absaroka, S.S. West Cape, S.S. Mystic and S.S. Ipswich, are now on regular schedules between Pacific Coast Ports and the Atlantic seaboard.

Shippers have available, too, McCormick fleet facilities between Pacific Coast Ports, South America, Havana and Jacksonville, and the Gulf ports.

Send for New Sailing Schedule



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From San Francisco—Los Angeles		
†S.S. Colombia	July 9	July 11
*M.S. City of Panama	July 16	July 18
*S.S. Venezuela	July 30	Aug. 1
*M.S. City of S.F.	Aug. 6	Aug. 8
†S.S. Ecuador	Aug. 20	Aug. 22

From New York—Cristobal		
S.S. Ecuador	July 16	July 26
S.S. Corinto		July 28
S.S. Colombia	Aug. 13	Aug. 23
M.S. City of Panama		Aug. 19
S.S. Venezuela	Sept. 3	Sept. 13

*Ports of Call—Mazatlan, Champerico, San Jose de Guatemala, Acajutla, La Libertad, La Union, Amapala, Corinto, San Juan del Sur, Puntarenas, Balboa and Cristobal.

†Ports of call—Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal and (Havana eastbound only), Cartagena and Puerto Colombia (Westbound only), and New York.

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We rank fourth in this class, outnumbered by Great Britain better than seven to one.

Ships of 20 knots and over:

Great Britain	12
France	11
Italy	9
Japan	2
United States	1
Germany	1

And in this class Great Britain attains an advantage of twelve to one. We rank with Germany with but one vessel in this group.

The foregoing illustrates very definitely our weakness in efficient ocean carriers compared with our principal competition nations. Even Germany has been able to establish herself as a formidable competitor in the world's trade routes. In her fleet of today, over 60 per cent of her total tonnage is less than five years old, with the economic supremacy that that implies.

We seem to be content to operate ships which were constructed to meet a war emergency, and unless a policy of replacement is adopted immediately we shall soon fade from the picture and again have to rely on our active competitors to carry our commerce to and from the ports of the world.

American shipping costs more, due to higher construction and operating costs; and we are adding to that handicap by operating obsolete types of vessels in competition with the faster and more modern types of our competitors.

New Construction Needed

It is vitally necessary to embark immediately on a new construction program to provide our nation with competitive types of commerce carriers and at the same time save our shipbuilding industry from absolute failure. Shipyards of our country have long been on a starvation diet and we cannot either from an economic or protective point of view permit this industry to decline.

It seems rather inconsistent for this nation to have scrapped 850,000 tons of naval vessels (many of them the most modern types of fighting ships), and with them world naval supremacy, at a cost of almost 400 million dollars and then hold on like grim death to obsolete types of merchant ships while other nations have disposed of their inefficient ships without delay. At the Washington Arms Conference in 1922, the United States made a sincere effort to assist other nations to curtail their expenditures by acquiescing in the apparent desire for world disarmament; and we proved our absolute sincerity in agreeing to and complying with the scrapping program.

Washington Treaty

We even consented to one of the Washington Treaty nations constructing capital ships after the Washington Conference, thereby providing work for its shipyards. In addition to this, when we glance over the world's shipbuilding activities for the past five years, we find all the nations who participated in the treaty have far outbuilt this country in combatant types of vessels. And today we are considerably below the naval strength agreed to at the Washington Arms Conference, which in spirit and principle was intended to cover all types of fighting ships. The American people most certainly felt that the strength of their navy should be, at least, the equal of that of any of the Washington Treaty nations. But after five years we find that we are trailing far behind.

It is astounding the progress our competitor nations have made in the upbuilding of their merchant and naval fleets, particularly since the signing of the Washing Treaty; and it would be rather interesting to know how far American dollars have aided other nations in the strengthening of their sea power.

Of the 12 billion dollars in private American loans it is reasonable to assume that American dollars have aided these nations considerably in furnishing their shipyards with work in the construction of modern commerce carriers with which American flag ships must compete, and American dollars, no doubt, are playing an important role in the strengthening of their navies. Added to these activities in foreign shipyards, we are still further aiding them by numerous contracts which have been placed abroad for American account.

Under these condition, how can our shipbuilding industry survive? It would seem that after all, "Uncle Sam Shylock," is a most liberal individual in assisting his friends across the seas and it is high time that some consideration be given to our problems at home, particularly that of our sea power, which vitally affects the welfare of the entire nation.

If our nation is to continue to prosper it is highly essential that the American people awaken to the fact that American ships of commerce are an absolute necessity, not only to insure to American industries uninterrupted ocean transportation in carrying their surplus products to the markets of the world, but to insure the continuous flow of our inbound commerce which is essential for the maintenance of many of our industries.

In the matter of national defense it is obviously necessary that we have an adequate fleet of commerce carriers to support our navy, as it is the combined strength of both the naval and merchant fleet that reflects the sea power.

The French Line steamer Jacques Cartier, one of the fine cargo liners now plying between the Pacific Coast and Continental Europe.

Wonders of the Deep Sea

Extracts from an Article by Captain Frederick B. Bassett (Retired) U. S. Navy

(Reprinted from The Army and Navy Courier.)

FROM the very earliest days man has always felt a compelling interest in the oceans, first of all because they contained fish and other things good to eat and offered an easy means of getting from place to place along the coasts, and second because of the mystery of the vast expanse, the tides, the winds, the currents, and the saltness of the waters.

The surface of the earth measures 196,700,000 square miles, of which 139,686,000 square miles, or about seven-tenths, is covered by the seas. Over about three-fifths of the whole area of the oceans, or over nearly half the area of the globe, the bottom lies from 12,000 to 18,000 feet, or between two and a third to three and two-fifths miles, beneath the surface of the sea.

Those areas of the sea bottom which lie more than 18,000 feet below the surface are known as deeps. Although these deep spots occupy only a relatively small percentage of the sea floor, their total area being about nine millions of square miles, they are extremely interesting from an oceanographic point of view. There are 57 of these deeps, of which 32 occur in the Pacific, 19 in the Atlantic, and six in the Indian Ocean, one of which is continued into the Atlantic. A curious thing about these deeps is that all of them are near the land.

The ocean's deepest known spot was discovered only very recently. A few days ago it was announced in the daily press that the Japanese surveying steamer Manshu discovered about 145 miles southeast of Tokyo a depth of 32,636 feet, or 6.18 miles. Before this the greatest depth was in the vicinity of the Philippines, 40 miles east of Mindanao, where a depth of 32,113 feet or 6.08 miles had been measured some years ago. Previous to this the greatest depth determined was in the Nero deep near Guam, where in 1899 the U.S.S. Nero found 31,614 feet, or nearly six miles.

Mt. Everest, in the Himalayas, rises 29,002 feet above sea level. The deep spot discovered by the Manshu is therefore 3,634 feet further from the surface of the sea than the summit of the highest mountain known.

From the bottom of the deepest spot known in the ocean to the summit of the highest mountain is 61,638 feet, or nearly 11.7 miles. But this range in altitude is very small when compared with the diameter of the earth, about 8,000 miles. On a six-foot globe a scratch one-tenth of an inch deep would represent the extreme variation in the irregularities of the earth's surface.

The amount of water in the oceans is 302 millions of cubic miles, or 13 times the volume of all the land above sea level. The average height above the level of the sea of the various land areas is about 44 one-hundredths of a mile; the average depth of the sea is somewhat over two miles.

Broadly considered, the waters of the ocean are relatively simple and remarkably uniform in composition; studied in detail, the water is found to contain many substances. Thus, in addition to the more abundant chemical elements, such as sodium, chlorine, oxygen, and hydrogen, sea water also contains iodine, fluorine, nitrogen, phosphorus, arsenic, silicon, boron, lithium, rubidium, caesium, barium, stronthium, aluminum, iron, manganese, nickel, cobalt, copper, zinc, lead, silver and gold.

The volume of the saline matter dissolved in the waters of the oceans is 4,800,000 cubic miles, or enough to cover the entire surface of the United States, exclusive of Alaska, 1.6 miles deep. Of this saline matter 77.76 per cent is common salt. The concentration of this saline matter in sea water varies considerably from place to place. The highest concentration is in the Red Sea, where evaporation is greatest; the Adriatic is the next.

Each year the sea receives 157 millions of tons of sodium from the rivers into which the rains have washed it from the soil. Let us see what the flow of a river means in this connection.

Every year the Mississippi River carries to the sea 98,369,000 tons of saline matter, taken from an area of 1,259,000 square miles; the waters of the St. Lawrence brings down 29,278,000 tons from an area of 286,900 square miles; the Colorado delivers 13,416,400 tons from 225,000 square miles; and the Potomac brings down 771,000 tons from 9650 square miles. The total amount of saline matter carried to the sea each year by these four rivers is 143,834,400 tons, taken from 1,780,000 square miles, at the rate of from 60 to 102 tons for each square mile of area drained. An average of the waters of 19 rivers shows 762,587 tons of saline matter per cubic miles of river water.

It is a curious fact that in their chemical character fresh and salt water are quite opposite. For instance, in the ocean water sodium is more abundant than magnesium and magnesium is more abundant than calcium; while in fresh water calcium is more abundant than magnesium and magnesium is more abundant than sodium—a complete reversal. In average river water sodium is largely in excess of chlorine; in the ocean the opposite is true.

From the sea chlorine and common salt rise with the vapor from the water and are carried back with it over the land to a greater or lesser extent. Chlorine is abundant in the air only near the sea. The amount of salt carried from the sea onto the land is by no means inconsiderable. At the Royal Agricultural College of Cirencester, England, an average of the observations for 26 years shows 36.1 pounds of salt per acre yearly deposited on the land, while at Barbados, in the West Indies, 116.98 pounds of chlorine fall annually on each acre.

From the rate at which sodium is every year poured into the sea by rivers it has been calculated that it would have required from 80 to 90 millions of years to accumulate the amount of sodium now found in the oceans.

Thousands of millions of tons of gold are dissolved in the waters of the oceans, in a concentration of from half a grain to one grain per ton of water. At this concentration there would be 10 dollars worth of gold in each 250 to 500 tons of ocean water.

The North Pacific Ocean is considerably less saline than the North Atlantic. Why should this be so? Nearly all of the great rivers of the world flow into the Atlantic, or into the Arctic, which is a northward continuation of the Atlantic connected with the Pacific only by a narrow and shallow strait. Now rivers bring down saline substances which have been dissolved out of the soil of the areas which they drain. The rain which forms the rivers has been evaporated from the surface of the sea, but in being evaporated it has left the salt behind. Thus a large river means that a large amount of saline matter is being delivered to the ocean. Since practically all the larger rivers flow into the Atlantic, the saline matter is being piled up faster there.

Besides this, along the eastern shore of the Pacific from Alaska to Cape Horn, there are almost everywhere high mountains, so high that the sea winds lost their moisture in the form of rain in passing over them. Thus the Pacific loses almost no water toward the east, either in North or South America. But the eastern shore of the Atlantic in nearly all of Europe and in Africa is low. The winds from the Atlantic carry the water vapor from that ocean far inland, and much of the resulting rain or snow in Central Asia and in Africa help to provide water for the rivers running to the Pacific and the Indian Oceans. Thus the Atlantic every year loses a large amount of water, which has left its salts behind, to the Pacific and the Indian Oceans.

Sea water contains a great amount of air which the fishes and other creatures breathe. Whereas, the air about us is composed of about 20 per cent oxygen and 80 per cent nitrogen, the air dissolved in sea water contains nearly 34 per cent of oxygen, or more than half as much again.

Let us briefly compare the three great oceans. The Pacific Ocean occupies 68,634,000 square miles, two-thirds of which area is between 12,000 and 18,000 feet in depth. It is only in the Pacific that depths of over 30,000 feet are found. The Pacific differs from the Atlantic in having more steeply sloping sides both on the east and on the west, greater depths, and many small islands, chiefly of volcanic and coral formation.

The Last Word in Whaling

By Frank C. Bowen

THE old bark-rigged whalers on the Pacific, both before the era of steam and when they were fitted with auxiliary steam engines, were among the most interesting ships afloat, and young or old it was impossible to avoid the romance of the business when it was carried out with hand-thrown harpoons and pulling boats. Presently, however, guns, explosive lances, and even highly compressed air which killed the whale by blowing him up like a balloon, robbed the business of more and more of its romance, although it certainly added to its safety. Then came the little steam whaler adapted from the famous North Sea trawler and now we have the very last word in the conversion of the tanker San Gregorio into the floating whaling depot C. A. Larsen which will be used principally in the Ross Sea. Originally she was a tanker of ordinary design, with her engines aft, but the alterations that have been effected have given her a most extraordinary appearance. The top of her straight stem is carried out in a colossally powerful crane. Under this the bow of the ship is built out and closed with huge doors, the effect being very much like one of the old-fashioned above-water torpedo tubes, magnified in size many times. This tunnel has a diameter of no less than 20 feet while the door that closes it weighs nearly 60 tons.

The purpose of this tunnel is the adaptation of the scheme that was tried on board the Lancing, originally the Greenshields Cowie steamer Knight Errant. This steamer, which also flies the Norwegian flag, was converted for two purposes, firstly to avoid paying the heavy export dues levied by the Falkland Islands Government and secondly to avoid the long tow by the little whaling steamers which is necessary when the depot cannot following them to the grounds. Her stern was cut away and over the propeller a big inclined slipway was built, running into the water. The whale could be hauled inboard bodily, not only permitting it to be flensed and tried out no matter how heavy a sea was running, but also preventing the sharks getting a large portion of the catch. This experiment proved to be a great success, so that the Rosshavet Whaling Company decided that they would go one better and convert a ship which was already fitted with numerous tanks in which the oil could be stored. Such a ship was bound to have her machinery aft, so that the runway was built forward.

After being very carefully cleansed of the last vestiges of their mineral oil, the tanks were left practically intact and a shelter deck with a headroom of 15 feet built for three-quarters of the length of the ship. Into this were fitted two long rows of boilers, 46 in all, separating apparatus, and innumerable tanks. All the boiling is to be done by steam so that an additional cylindrical boiler was fitted.

Practically the whole of the work is to be done automatically, as the carcass of the whale is dragged out of the sea. Instead of the old-fashioned method by which men hacked at the blubber with axes and spades, it is removed mechanically and chopped up so fine that it can be sucked into the boilers by means of pumps.

When the blubber has been cut off the carcass it is carried right aft where the meat and bone are cut up with steam driven saws and boiled down. The installation of auxiliary machinery is remarkable, no less than nine big cranes with a lifting capacity up to thirty tons apiece being fitted in order that the whale may be handled conveniently, while two huge capstans haul her out of the water.

For this work the C. A. Larsen carries a crew of 250 men, accommodated in a big deck house on the main deck aft, the accommodation being in cabins of four and six berths. Separate mess rooms are fitted, and as the ship will be away on a long cruise a big canteen and hospital has also been provided. In addition to a very complete wireless telegraphic installation, which is capable of carrying to Europe from the Ross Sea, she has a first-class receiving set with loud speaker and everything that can add to the comfort of the crew. The ship herself burns oil fuel under her boilers but she carries a large quantity of coal for the use of the little whaling ships which do the actual harpooning. In order to transfer this with the minimum of delay and trouble she has an electrical bunkering apparatus which hitherto has only been installed in ports.

Altogether the conversion of the tanker is a masterpiece of ingenuity and is the result of many years' careful study of Antarctic whaling conditions.

NORTON, LILLY & COMPANY

General Agents, Pacific Coast

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(Intercoastal Service)

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Who's Who afloat and ashore

Edited by Jerry Scanlon

Bill Smith

WHEN the steamer La Touche arrived in San Francisco, after completing her charter of three months to the Panama Mail Steamship Company, there was a delegation of friends on hand to greet William (Bill) Smith, purser, who is one of the best known steamship officers sailing out of Pacific Coast ports. As soon as the vessel berthed the welcome committee proceeded to the purser's office. "Where's Bill Smith?" was the chorus of voices directed towards a tall figure attired in ship's uniform and wearing an excellent growth of very, very black hirsute.

"That's me," was the answer, and sure enough it was Bill Smith. He explained that he had let his beard grow for three months while he was in Latin-America. Purser Smith was forced to repair to the United States Marine Hospital a few days after his arrival, having been taken down with illness. He is expected to be around in a week or two, and will join the local offices of the Panama Mail until being assigned again to a berth aboard one of the company's vessels.

William Calcutt, formerly chief officer aboard the motorship City of Panama, who was confined to the Marine Hospital at San Francisco for several weeks on account of injuries suffered to his leg while down the coast aboard ship, has fully recovered and is now first officer aboard the motorship City of San Francisco. He succeeded Edward Wagner, who is remaining shore-side on vacation.

Daulton Mann, general manager of the Panama Mail Steamship Company, who has been in Europe for more than six weeks attending the coffee conference in Paris, has returned to San Francisco.

Mr. Mann reported that shipping conditions in Europe were excellent. While in New York, Mr. Mann conferred with Gale Carter, president of W. R. Grace & Co., and other executives of the Grace interests on the East Coast. Mr. Mann was accompanied by Mrs. Mann. He returned from overseas aboard the Steamship Berengaria.

Clay Hutchinson, who was formerly identified with the San Francisco offices of the Panama Mail Steamship Company, but for the past five years Los Angeles manager for the company, left for the East Coast with Mrs. Hutchinson aboard the steamer Ecuador. Mr. Hutchinson will inspect all the company's agencies in Mexico, Central America, Panama, and Cuba on his trip to New York.

The United States Lines have overcome the $1,000,000 deficit incurred last year and already have a net earning for the present year of $200,000, Mose H. Hunt, Pacific Coast manager for the United States Lines, was informed in advices received from President Dalton of the Merchant Fleet Corporation. The advices stated that the showing was the result of the intensive drive of the corporation for increased passenger and freight traffic and of a reduction in operating expenses.

The newly completed Port Accessories Building of the Matson Navigation Company, at San Francisco, which was designed and built to expedite the outfitting of Matson vessels, has been completed. The structure stands at Bryant and Main Streets, within one block of the Matson docks. It is a five-story building and is one of the finest structures in the vicinity of the waterfront. The entire top floor is devoted to handling linen for the twenty-three vessels of the Matson fleet. One of the most finely equipped laundries on the Pacific Coast is incorporated in the building. Other floors are given to the purchasing, commissary, and store room. There is a complete testing apparatus and preparation machinery for ship's stores, as well as other features designed to expedite the handling of all food stuffs. In the commissary department there are fourteen refrigerated rooms of various sizes and varying temperatures for meats, vegetables, fruits, poultry, ice cream, and other such stores required for the vessels. The new building will be ready for occupancy early this month, and already many of the dock departments have been moved to the new structure.

E. D. Tenney, heretofore president of the Matson Navigation Company, was elected chairman of the Board of Directors, at a special meeting held last month. The office was created at a unanimous meeting of the directorate. William P. Roth succeeded Mr. Tenney as president, and the former's position as vice-president was conferred on A. C. Diericx.

Private advices received by San Francisco officials of the Nippon Yusen Kaisha are to the effect that the Industrial Bank of Japan has decided to undertake financial operations for the shipping business once more. The bank formerly financed shipping but was forced to suspend operations in that line a few years ago due to the depression in shipbuilding and shipping conditions. The bank advanced large sums to the Kokusai Kisen Kaisha

Miss "Cordage," of New York, learning the art of splicing rope from Chief Officer George V. Richardson and Chief Engineer Harold Carter on the Panama Pacific intercoastal liner Manchuria.

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and several other large Japanese steamship companies during the war on the security of their vessels and the subsequent sharp decline in ship values placed the bank in a difficult position.

According to the new plan drafted by the bank authorities, the new advances will be based upon the cost of building new ships of large size. This cost now ranges from 100 to 120 yen a ton.

Advances on well-equipped second-hand ships are to be made, up to a limit of 60 per cent of the cost price. Advances on large new ships are to be refunded in monthly installments over a period of 20 years. The terms of loans on second-hand ships will be shorter, depending in each case on the age of the vessel. The interest rate is to be almost 9 per cent, and, according to the advices, the Industrial Bank of Japan plans to issue debentures in the near future to get the necessary funds for this new business.

The hospitality of San Francisco civic leaders and shipping men was showered on Dr. William Cuno, managing director of the Hamburg-American Steamship Line, during the visit here of the former German chancellor. Accompanying Dr. Cuno was Mrs. Cuno and Otto Krug, director and assistant general manager of the company. The visitors' stay on the Pacific Coast was marked with luncheons, banquets, and entertainment.

Dr. Cuno marveled at the shipping facilities on San Francisco Bay. Under escort of Theodore Henry Jacobs, manager of the San Francisco offices of the Hamburg-American Line, the distinguished visitors were taken on an inspection trip of the bay, which included a survey of piers and shipbuilding facilities and terminals.

Passengers aboard the line Ecuador on the last visit of the steamer from New York presented Chief Engineer Merrill Johnson with a beautiful painting of a Spanish galleon. Chief Johnson is one of the most popular engineers sailing out of San Francisco.

Captain Robert Dollar headed the delegation of San Francisco shipping men who attended the Fourteenth National Foreign Trade Convention in Detroit last month. Other well-known figures who accompanied Captain Dollar for the meeting were Harry S. Scott, president of the General Steamship Corporation; W. J. Edwards of Norton, Lilly & Co., Harry Evans of E. C. Evans & Sons, and Frederick J. Koster of the California Barrel Company.

A unique engineering feat was carried out at the yard of the Pacific Coast Engineering Company in Oakland recently when two big steel aprons, each weighing 20 tons, were hoisted aboard a Haviside derrick barge and transported across the bay to the foot of Hyde Street, San Francisco, where they were installed for the Golden Gate Ferry Company. Each apron made a framework 75 feet long and 22 feet wide. In all previous construction of this kind the aprons were built right in the slip with a consequent waste of much time. The job was an urgent one, and the Oakland engineering firm worked out the system of building the aprons separate from the slips.

Jimmie Summitt, genial purser of the steamship Leviathan, who is making many friends for the United States Lines.

Two more old familiar sailing ships that have long made San Francisco their home port have been sold. The ship William T. Lewis has been sold to James Griffith & Sons of Seattle for $8000, and the barkentine Kohala was disposed of to the Hermosa Beach Amusement Company. Both vessels were formerly owned by Hind, Rolph & Co.

Two ringing addresses were delivered at the convention of the National Foreign Trade Council in Detroit that brought thunderous applause by those present. Captain Robert Dollar said in brief:

"You, business men interested in shipping, get Congress to put us American shippers on an exact equality with foreign competitors and we will give you a merchant marine that you will be proud of."

Ira A. Campbell of New York admonished those present: "Don't give up the ships." He asserted that unless government plans are changed we are headed for a permanent government merchant marine and private shipping is doomed. He pictured the United States Shipping Board as a vital and immediate menace to a private American merchant marine.

G. A. Atwood, for many years connected with the cashier's office in the Luckenbach Steamship Company, has resigned. His position will be left vacant, according to Lewis Luckenbach, vice-president of the company, who returned East after more than seven weeks spent on the Pacific Coast.

Another shift in the Seattle organization of the Luckenbach Company was the appointment of T. E. Smith, formerly chief of the stevedoring department, as marine superintendent to succeed Captain Edward Murphy, who was ordered to take command of the steamer Florence Luckenbach. Both officers are veterans in the Luckenbach service.

The five vessels operated by Westfal-Larsen between the Pacific Coast and South America are to be equipped with refrigerating space, according to an announcement made. The vessels to be equipped are 9000 tons each and the work will be completed before the end of the year. Drew Chidester, vice-president and general manager of the General Steamship Corporation, Pacific Coast agents, stated that the vessels will have accommodation for from 1000 to 1500 tons of fruits and other perishable cargo. The vessels are the Brandanger, Hoyanger, Evanger, Leikanger and Hardanger, all 11-knot vessels. The work will be carried out in Norwegian yards.

Growing demand for Pacific Coast fruits, vegetables, and dairy products in South America was one of the factors that determined the owners to equip the five vessels with refrigerator space.

Al Nowland, veteran transpacific purser with the old Pacific Mail

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To and From
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Steamship Company, is in San Francisco confined in the Marine Hospital. Nowland, who has been for the past several years with the Panama Agencies in the Canal Zone, was returning to San Francisco aboard the steamer La Touche when he slipped and fell into the vessel's hold. For two months he was in a precarious condition in Acapulco. He was brought to San Francisco and sent to the Marine Hospital to recuperate.

San Francisco Pilot Edward Mason is back with his fellow officers aboard the Gracie S. after a vacation East. This marked the first time that the veteran bar pilot had ever made an overland journey. He reported that the trip was all right for a landsman, but the roll of an ocean liner or the tossing of the Gracie S. was more to his liking.

John Kane, chief engineer aboard the Admiral Peoples, ex-Mary Weems, states that the vessel is one of the finest steamers he has ever sailed aboard. Kane went east to bring the vessel out to the Pacific Coast.

Percy Jordan is chief engineer on the Admiral Benson, sister ship of the Admiral Peoples. This vessel was formerly the Esther Weems.

Change of the vessels' names was carried out in San Francisco port with officials of the Admiral Line from the main offices in Seattle attending the christening. The two vessels are welcome additions to the coastwise fleet of the Admiral Line. Captain James Brennan, operating manager, and E. Grant McMicken, came from Seattle to receive the vessels. The craft are modern oil-burning ships of 5000 tons deadweight and they are 312 feet in length. They were purchased from the Baltimore and California Steamship Company.

William T. Hunter, formerly with the freight department of the Panama Mail Line, has joined the California and Eastern Steamship Company, of which A. P. Hammond is vice-president and general manager.

The death of Mrs. Maude Mann, mother of Daulton Mann, on June 12, came as a distinct shock. Mr. Mann, general manager of the Panama Mail Line, was in Paris when he received a cable announcing his mother's passing. The offices of the Panama Mail Line were closed a half day to permit the employes to attend the funeral. Mrs. Mann was well-known to hundreds of sea captains and ship's officers, having voyaged to all parts of the world in past years. Her death followed a short illness.

Chief Engineer Henry Andren of the Panama Mail motor liner City of San Francisco.

In recognition of meritorious service, Richard P. Worthington is now wearing four gold stripes on his sleeve and the insignia on his cap says "Chief Engineer" aboard the freighter West Farallon. He served for sometime as first assistant aboard the craft.

Fred Buckley, chief engineer of the West Cactus, is shoreside at San Francisco and his place is being filled by Dan O. Tickner, formerly first assistant. Tickner had been shoreside for sometime working at the Hanlon Drydock & Shipbuilding Company, but he succumbed to the call of the sea and states that he is mighty happy to feel the roll of a good ship once again.

Chief Engineer Henry Andren of the Panama Mail Line motorship City of San Francisco is a very active booster for increasing the population of California, according to Captain T. K. Oaks. The genial chief has been aboard the City of San Francisco since the vessel was built for the Panama Mail. With Mrs. Andren he makes his home in San Francisco and declares that he will go farming before he sails out of another port.

The Matson South Seas and Australian service is the new name for the old Oceanic Line, according to an announcement made by Matson. The Oceanic Line was purchased a year ago by the Matson interests. The fleet is composed of the Sierra, Sonoma, and Ventura.

Alexander Ryan, popular chief engineer aboard the Oceanic liner Sierra, is back at his post after being confined to a hospital for several weeks. During this time his place was filled by Joseph Fitzgerald, first assistant.

Captain Andrew Martin, who served for two years as port captain for the old Pacific Mail Steamship Company, is now identified with the Board of Marine Underwriters in San Francisco.

Captain T. H. Dobson, perhaps who was more influential in China than any other skipper sailing the Pacific, is now engaged in marine surveying in San Francisco.

Captain Cecil Brown of the Board of Marine Underwriters at San Francisco, has recovered from an illness that kept him away from his office for many months. He is to be seen on 'Change every day now, and is a welcome figure among the shipping men who gather each day to discuss matters marine.

W. G. Winne, Jr., formerly in the San Francisco offices of the Luckenbach Steamship Line as purchasing agent, is now district manager at San Pedro for the Company.

A quarter of a century ago, Edward T. Ford joined the W. R. Grace & Company as office boy. His twenty-five years of fine service was recognized last month when he was notified that the board of directors had elected him vice-president in charge of all the Pacific Coast operations of the company extending from Seattle to Colombia. He will also carry the title of general manager.

Mr. Ford is one of the most popular steamship executives on the Pacific Coast. In addition to his position with the Grace interests, he is president of the Panama Mail Steamship Company. Mr. Ford stated that he has had only one employer—W. R. Grace & Co., and that his services have been continuous for a quarter of a century. When he first entered the Grace offices there were twelve employes. Today the office records show a total of three hundred.

On your drive around the Island of Oahu—you, too, will be able to refresh yourself with the sun-ripened pineapple.

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for a delightful holiday
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HAWAII! Uncle Sam's romantic wonderland out in the blue Pacific—an island playground where life is restful and people are kind—where you are welcomed with "Aloha Oe" and where you say good-bye reluctantly, wreathed in fragrant flowers! Hawaii is a place of sentiment, of the poetry of magic nights. Her hills are always green, her flowers always blooming, her climate always May. Whole trees burst into bloom in summer—there are strange but delicious tropic fruits to eat—velvet water, peacock-blue, to bathe and swim in at famous Waikiki. There are strange sights to marvel at—natural wonders to see. The Rainbow Isles are calling.

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S.S. CITY OF HONOLULU	July 2
S.S. CALAWAII	July 9
S.S. CITY OF LOS ANGELES	July 16
S.S. CITY OF HONOLULU	July 30

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Economic Factors in Steamship Advertising

An Analysis of the Methods for Successful Publicity in Overseas Freight and Passenger Traffic

By Frederick Sturgess

ADVERTISING today is (or ought to be) primarily a business of selling in print. Who can tell what the future holds in advertising methods, the radio, broadcasting of moving pictures, or other undreamed of methods of conveying ideas quickly and clearly from place to place, and from individual to individual in the desirable contact of mind with mind?

A successful advertising man is primarily a salesman, and a salesman, as the contact between seller and buyer, must concern himself intimately with basic matters and fundamental ideas. To be a good copy writer, for instance, he must be conversant with the elements of copy, style, words, the length of copy, and circumstances governing same, not to mention the vital and important part that pictures play when harmonized with good reading matter. How much more necessary is it then that the man who directs the policy of advertising, more even than the man who executes that policy, should have a knowledge of the basic matters surrounding his analysis and influencing his judgment. One well known economist, recognized as one of the leading authorities in finance and trade conditions in the United States, remarked a few years ago that every business whether large or small is governed by conditions 80 per cent of which are not under the control of the management of the business. For example, in the typical case of the corner grocery store, the conditions relating to a profitable turnover are about as follows: rent, number of potential customers within purchasing radius of store, wholesale price of commodities, retail price of commodities, wages, and interest charges, all of which are entirely governed by local conditions, money rates, and competition. The only feature over which our corner store merchant has definite and complete control is the internal economy of his shop—the employment of efficient help, the elimination of waste, leakage, loss, and minor matters.

Considering the word "romance" in connection with steamship advertising, what a breadth of vision is necessary that our focal point may culminate in efficient management. How essential in steamship operation that we understand the many forces that vitally influence us, over which we have no control whatever—an understanding that seems to have been sadly lacking in our merchant marine, with its tremendous cost of operation and management.

One of the most important essentials in formulating a policy in the steamship world, is to keep abreast of the times, to be well informed, and to understand the value and the use of information coming to hand. Man continues to evolve; old ideas are replaced by new. Life continually changes. Today's viewpoint is neither yesterday's nor tomorrow's. The tremendous influences that have affected human behavior during the past thirty years are working vigorously today bearing heavily on every phase of man's conduct, economical, social, moral, and aesthetic. Careful analysis of United States shipping in general is a very important factor in the calculations of those who direct the policy of steamship publicity work. Of even more importance, I believe, is that wider vision, including not only national but international development, political as well as economical, is essential to those individuals who anticipate profitable business. They should have a broad knowledge and a wide understanding of such development.

The continually falling market on which we have ridden for some years resulting in the rapid change from old to new conditions, social, economical, and political, should provoke earnest thought. It is worth bearing in mind that the outstanding successful business men in the past two decades have been divided into two classes—masters of production and wizards of finance. Apparently these have had their day, and the trend indicates that overproduction, disorganization of prices, and the lack of markets are the problems of the immediate future. An era is now opening up in which success will depend on merchandising or marketing, with a thoroughness previously unknown.

How many of our intercoastal companies will be necessary to adequately care for intercoastal steamship business three years from today? is a question beginning to formulate in our minds. The recent rate conference at Little Rock is, we believe, the beginning of the end of overlapping, incompetency, and amateur fumbling with its attendant extravagance and lavish waste in unsound operation. Fourteen years ago, the same story was enacted in the history of our railroads. Today the situation affecting steamship competition is readily gauged by a mere glance at the actual tonnage statistics of ships built to the order of British, German, Italian, and Scandinavian operators, in proportion to our own, on a comparative foreign trade basis. Our railroads during their period of adjustment suffered only slightly through foreign competition, and that only on through traffic. Unfortunately in our marine disorganization the number of American ships that came empty into port last year, according to government statistics, was very significant and provided a wealth of meaning to the wise manager, the sagacious investor, and the sane operator.

Events in Europe, the only possible outcome of the Chinese situation, the basis of the Mexican trouble, the Nicaraguan scramble, and last but not least the very interesting strategic positions of the world's greatest navies, among other things, show clearly the direction of the great political and economical compromises and adjustments that are taking place among the nations in this period of the world's history. All have a very profound meaning to those interested in the underlying causes of events in world trade.

An understanding of other influences considered chimerical and abstract by the average individual are, I believe, of very prime importance to institutions reaching out and engaging in the enterprise of our foreign and international transportation and commerce. For example, even the present trend of our United States Government thought, intention, and action, our

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international relations, expectations, and plans, the caliber of the individuals who actually hold the reins of power both in the United States and abroad, the quiet combinations and affiliations of certain international banking groups, and many other matters that could be mentioned, have an indirect but nevertheless actual influence on the returns that will in due course pay tribute or otherwise to the cash registers of our shipping companies. Without giving any deeper consideration or further analysis to this very important subject, this is in my humble judgment a very appropriate time to recognize the fact that much of our shipping is facing " a hard winter," and that only those operating on a basis of sound finance, capable management, and actually able of their individual merit to render a real service, will survive.

The conditions that cradled and brought to young manhood a great deal of our modern merchant marine have passed away and to-day we find that same young man told by his government to find his own job, to stand on his own feet, and to sink or swim. What does this mean? It means, according to precedence, that in the broad, comprehensive, national, and international policies of these United States, our merchant marine is about to take its place on the high plane of efficiency with our other commercial and industrial institutions. It means that our shipping is about to become a business instead of a costly experiment. It means that it will either gradually dwindle to our 1913 level and worse, or that, through its equipment, management, operation, discipline, and service, it will compete equally and favorably with foreign ships.

Radio Extends Its Utility at Sea

By T. M. Stevens, General Superintendent, Marine Department, Radio Corporation of America

THROUGH some two decades of faithful, unselfish and heroic service the radio operator has carved for himself a prominent niche in maritime life. Now, with the application of broadcast reception and electrical reproduction of phonograph music, the radio operator enlarges that niche by assuming a new role. That of a veritable impressario of entertainment for the passengers of ocean-going steamers, to the end of making their journey just as colorful and enjoyable as it has already been made safe and comfortable.

Four ships on the Grace Line, the Santa Luisa, the Santa Elisa, the Santa Ana, and the Santa Teresa are now equipped with this latest and most versatile means of entertainment. A unique installation of broadcast receivers, including both standard wave and shortwave units, enables the radio operator to select the best broadcast program available during the day as well as during the night with its more favorable conditions. In addition, an electrical type of phonograph permits of a definite choice of musical selections. Either the radio or the phonographic entertainment is made available to the steamer passengers by means of a most powerful and realistic loudspeaker. When called upon the radio loudspeaker brings a diversity of entertainment never believed possible at sea. In short, the entire world of music has literally gone to sea.

The equipment for the radio entertainment on shipboard is quite apart from the usual radio apparatus that conveys the vital dots and dashes that go to make a radiogram. In the radio room of each ship a Radiola is installed, identical in every way with the receiver used in the home. However, this particular shipboard receiver is placed in a shielded case to protect its delicate mechanism from any induction arising from the electrical equipment and wiring of the ship, which might give cause for foreign noises in the radio rendition. Even the external conductors to the receiver are properly shielded so as to preclude this induction. This receiver with a super-sensitive and super-selective circuit comprising two stages of tuned radio-frequency amplification, a regenerative detector, and two stages of audio-frequency amplification, serves to intercept the usual broadcast programs on wavelengths between 200 and 550 meters.

In addition there is a shortwave receiver operating on wavelengths well below 100 meters, for the purpose of intercepting the shortwave relay transmission of certain American broadcasting stations. These shortwave signals, although calling for considerable skill in their interception, have such enormous carrying power, that signals are received loud and clear at distances of many thousands of miles, by means of a shortwave receiver. These shortwave signals of American broadcast stations, have made possible the rebroadcasting of American programs in England, Germany, South Africa, India, and other distant lands.

A special antenna system, comprising a short L-type antenna and a corresponding and coinciding L-type counterpoise, serves to intercept the broadcast signals. The counterpoise is to further reduce the induction pickup from the ship's electrical equipment, to an absolute minimum. As an added precaution even the lead-in wires from the antenna and the counterpoise running down to the radio room are shielded.

The radio operator attends to the reception of broadcast programs, either on standard broadcast wavelengths by means of the Radiola, or on the shortwave receiver for the shortwave relay signals. Once tuned in with proper clarity and volume, the desired signals are switched to the remotely situated loudspeakers either in the dining room of the ship, or on the promenade deck, according to the whims of the passengers.

On the promenade deck of the ship is the previously mentioned loudspeaker, with its self-contained power supply and power amplifier equipment. This device creates realistic and powerful sound waves by the piston-like movements of its small parchment cone. So delicate and responsive is this driving mechanism, and so light is the parchment cone, that every note, every tone and all the subtle shadings of the original music are instantly interpreted from their electrical equivalents to the corresponding recreated music. It is mounted in a weather-proof case, with hinged drop sides and hinged top, so that the woodwork and its mechanism may be properly protected. There is ample volume of music or speech for the entertainment of passengers in the open air—volume fully equal to that of a small orchestra.

Freights, Charters, Sales

June 21, 1927.

THE following fixtures are reported to the United Kingdom Continent: British stmr. Bridgepool, 35/-, barley, July, Strauss & Co.; British stmr. Skipsea, 35/-, wheat, Sept., Heatley & Co.; a steamer, 35/-, Aug., Edward L. Eyre & Co.; a steamer, 35/-, grain, Sept., Kerr Gifford & Co.; a steamer, 35/-, grain, Sept., Strauss & Co.; British stmr., Fernmoor, 35/-, grain, Sept., Balfour Guthrie & Co.; British stmr., grain, Sept., Canadian Cooperative Wheat Producers; British stmr., 35/-, Aug./Sept., Kerr Gifford & Co.; British stmr., 35/-, wheat, Nov., same charterers; British stmr, wheat, Sept., Strauss & Co.; British stmr., Callandia, 35/-, grain, Sept., Balfour Guthrie & Co.; British m. s., Vinemoor, Aug.; French stmr., Lina L. D., Aug., Canadian American Shipping Co.; British stmr. Venvorlich, wheat, July, Kerr Gifford & Co.

The British m. s. Alynbank is reported fixed from Columbia River to Australia, Aug., by J. J. Moore & Co.; also Norwegian stmr. Kalfarli, two trips, July, and Norwegian m. s. Borgestad, Columbia River to Port Pirie, $15 net, Balfour Guthrie & Co.

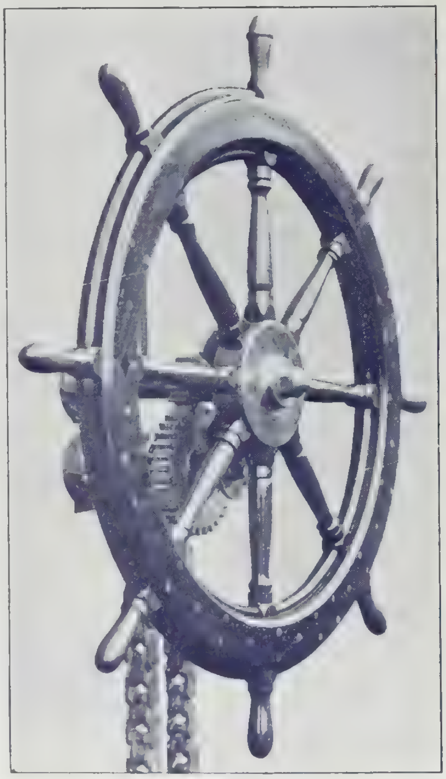
The following lumber fixtures to the Orient are reported: Japanese stmr. Taigen Maru, Yokohama, May, Canadian Transport Co.; Japanese stmr. Malta Maru, Japan, June, Canadian American Shipping Co.; Japanese stmr. Japan; Japanese stmr. Yonan Maru (relet), June/July, Canadian American Shipping Co.; Japanese stmr. Buyo Maru, June, Yamacho & Co.; Japanese stmr. Clyde Maru, June, Nakagawa & Co.; Japanese stmr. Erie Maru, same, June/July.

The British m. s. Hurry On is reported fixed from Puget Sound to South America by Sterling Steamship Co., prompt loading.

The following steamers are reported fixed with lumber to the Atlantic: American stmr. Maltram, Grays Harbor to New York, $16, June; American stmr. Santa Veronica, same, $15, June, Krauss Brothers; American m. s. East Indian, Puget Sound to North of Hatteras, July.

The British stmr. Valacea is reported fixed from Puget Sound and British Columbia to the United Kingdom/Continent, merchandise, July, Canadian American Shipping Co.; British stmr. Vulcan City, Puget Sound to U. K./Continent, lumber and merchandise, July, same charterers; British stmr. Ethelwolf, same, Aug.; a steamer, same.

The following time charters are reported: Norwegian m. s. Estrella, Pacific trade, delivery Colon, redelivery Australia, 7/9 months, $1.57½, American Trading Co.; British stmr. Silksworth, delivery Japan, redelivery Atlantic Coast Canada, Canadian Trading Co.; British stmr. Tritonia, Pacific trade, delivery Japan, 6/9 months, June, J. J. Moore & Co.; British stmr. Cragness, Pacific trade, delivery June, 7/9 months, $1.30, American Trading Co.; Norwegian stmr. Arna, delivery Norfolk, Va., May, redelivery Australia or South Africa via North Pacific, J. J. Moore & Co.; Norwegian m. s. Hinnoy, Pacific trade, delivery and redelivery Australia, 7 months, June, $1.65; British m. s. Iossifoglu, Pacific trade, delivery Colon, redelivery Australia, 9 months, option North of Hatteras, June, $1.60; Norwegian m. s. Balboa, delivery San Francisco, redelivery Cuba, June; Norwegian m. s. Vinland, delivery Colon, redelivery Australia, 4/5 months, July, $1.65, Pacific Export Lumber Co.; British stmr. Incemoore, delivery and redelivery North of Hatteras via British Columbia and West Indies, June, Canadian Transport Co.; Danish m. s. Nicoline Maersk, 4/5 months, delivery San Francisco, redelivery Australia, $1.75; stmr. Hampholm, delivery Colon, redelivery Australia, 6/7 months, $1.25; Danish stmr. Dansborg, delivery Gulf, redelivery North Hatteras, 3 months, $1.20.



The following sales are reported: American sc. Bangor, Alaska Codfish Co. to American Toll Bridge Co. (to be a hulk); American bktn. Thomas P. Emigh, Chas. Nelson Co. to N. C. Momstad, (to be converted into a fishing barge); American m. s. Glendaurel, Glendaurel Shipping Corp. to Crosby Marine Corp.; American bktn. Kohala, Hind Rolph & Co. to Hermosa Amusement Corp.; American sc. William T. Lewis, Hind Rolph & Co. to James Griffiths & Sons, Seattle, $8000; American stmr. Sacramento and Sutherland, U. S. Shipping Board to Chas. Nelson & Co., $104,000 and $107,000 respectively; American bktn. Makaweli, Hind Rolph & Co. to J. H. White, Los Angeles; Pan. stmr. Isonomia, W. L. Comyn & Co. to The Republic of Latvia; Am. m. s. Sierra, S. S. Freeman & Co. to C. J. Lomen.

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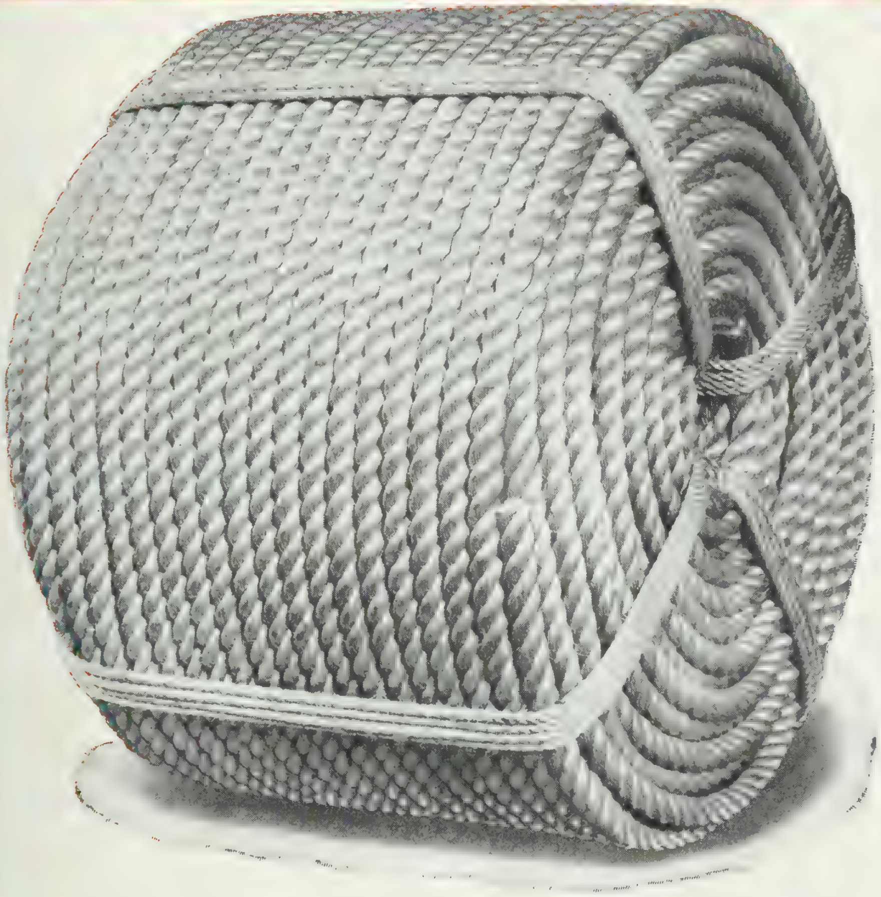
Pacific Marine Review

The National Magazine of Shipping

August, 1927



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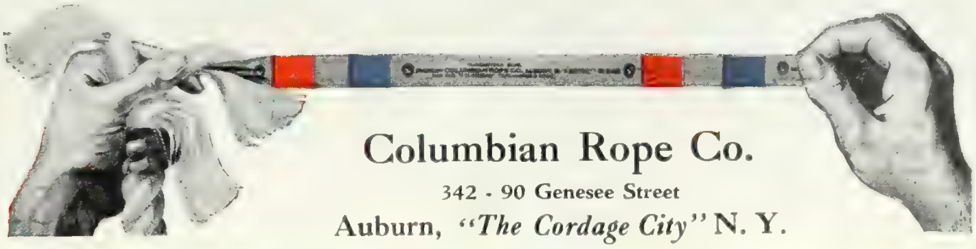

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OF THE PACIFIC COAST

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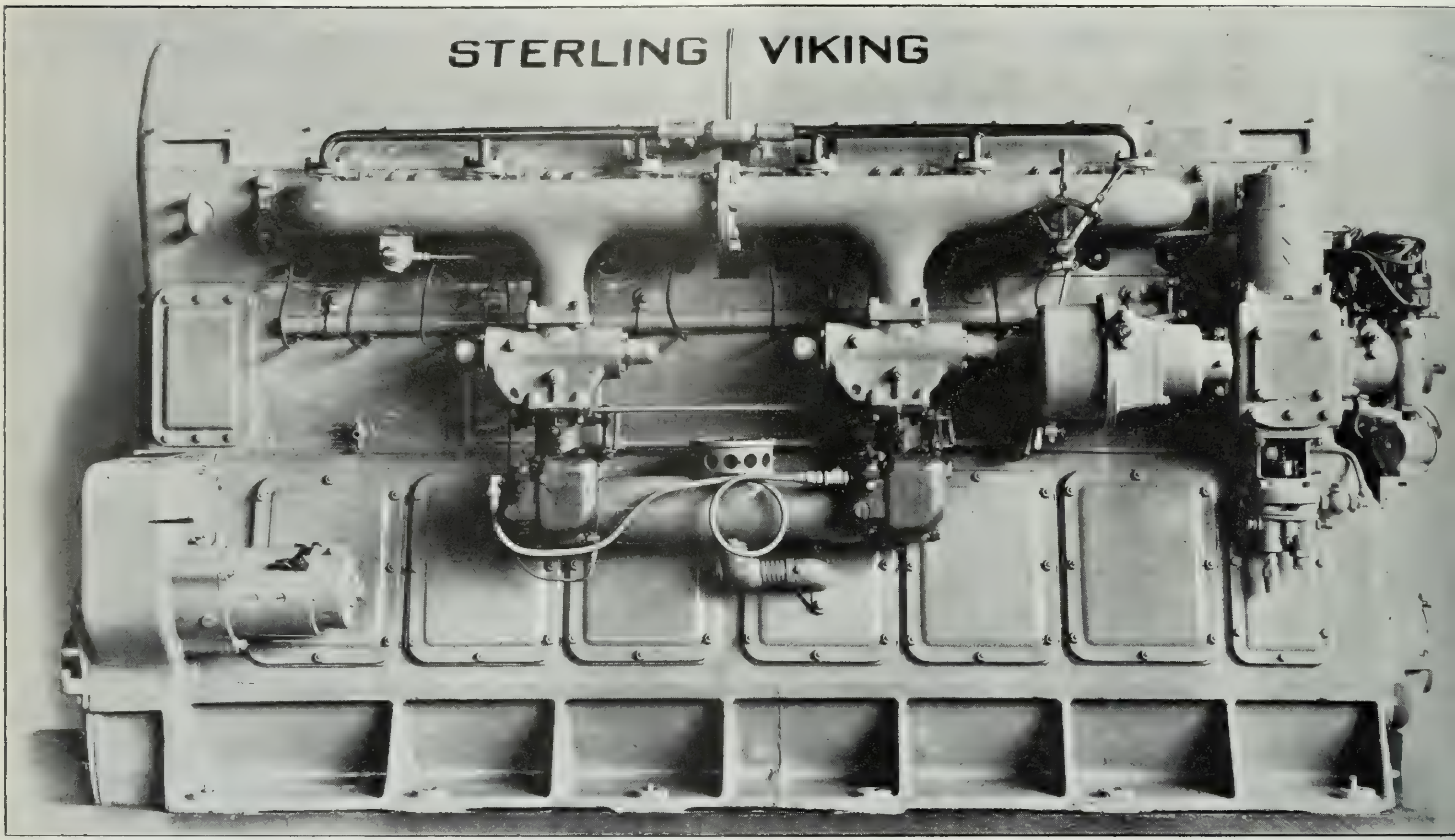

Selected by Portland
for their 3 new fireboats

The power plants of these splendidly designed boats consist of two 8-cylinder 8 by 9 special Viking type Sterling gasoline engines, each rated at 525 horsepower at 1200 revolutions a minute, and two 6-cylinder 8 by 9 special Viking type Sterling gasoline engines, each rated at 375 minute, but capable of developing 565 and 425 horsepower respectively at those speeds. The two 8-cylinder engines are direct connected at their after ends through clutches to propeller shafts and at the forward ends through clutches to the pumps.

Sterling gas engines in the Seagull, Coast Guard, and Viking marine types all feature removable cylinder liners similar to the best diesel practice. All crank shafts are carefully counterbalanced and all bearings, including wrist pin, are full force feed lubricated. Electric starters are part of the equipment. These medium speed, high duty engines are proving themselves to be sturdy, dependable, compact power plants on many commercial and pleasure craft.

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Pacific Marine Review

CONTENTS

August, 1927

Frontispiece 7

Editorials 349

"Don't Give Up the Ships," by Ira A. Campbell 352

An analysis of the present situation in the American merchant marine, with foreword and comment by Captain Robert Dollar.

The Silent Revolution in Transport and Trade, by Norman F. Titus 354

Accelerated speed in movement of commodities a necessity in the financing of modern merchandizing.

The American Ship Frederick Billings, by F. C. Matthews 357

Ross Shire Passing Kentmere 358

Reading Between the Lines, by Martin H. Gerry 359

The Diesel Barge Tydol 361

New bulk oil carrier for the bay and canal service of the Tide Water Oil Company.

Cables Bring Knowledge of Ocean Depths 365

Pier B-C at Vancouver Finest Terminal on Pacific Coast 366

De La Vergne Oil Engines 367

Mobile Radio Beacon and New Type Radio Compass 368

Nelseco Double-Acting Diesel 370

3680 brake horsepower, 2-cycle, double-acting engine for United States Shipping Board finishes 30-day test with no stops.

Pacific Workboats and Their Power Plants:

- With the Boat and Engine Builders 371
- Winton Powered Wrigley Fleet 373
- A Five-cylinder Western-Enterprise 374
- A Big Little Coastwise Liner 375
- Mianus Diesel Display 375
- An Overland Workboat 376
- Boatbuilding at Inverness 376

Auxiliaries, Ship Supplies, Marine Equipment:

- Importance of Temperature Measurement in Diesel Engine Operation, by J. W. Schwarz 377
- Handling Freight on a Passenger Liner 378
- Centrifugal Pump Efficiency Guarantees 379
- Standard Steel Fishing Boats, by George J. Kuhrts Jr. 380
- Better Service on River Freight 380
- Interesting Battery Installation 381
- The Davis Pressure Regulator 381
- Compact Refrigerator Unit 381

Oil Purification on a Government Dredge 382

Marine Insurance 383

American Shipbuilding 389

Trade and Traffic Trends:

- The Extra Hazard of Government Ownership, by Captain Robert Dollar .... 11 Adv. Section
- Who's Who Afloat and Ashore .... 17 Adv. Section
- Pacific Foreign Trade and Travel Exposition .... 23 Adv. Section
- Freights, Charters, Sales .... 25 Adv. Section

British Navy in the Pacific, by Frank C. Bowen .... 33 Adv. Section

Of a General Nature:

Harvest of the Sea, 360; New McIntosh & Seymour Appointment, 382; Book Reviews, 388.

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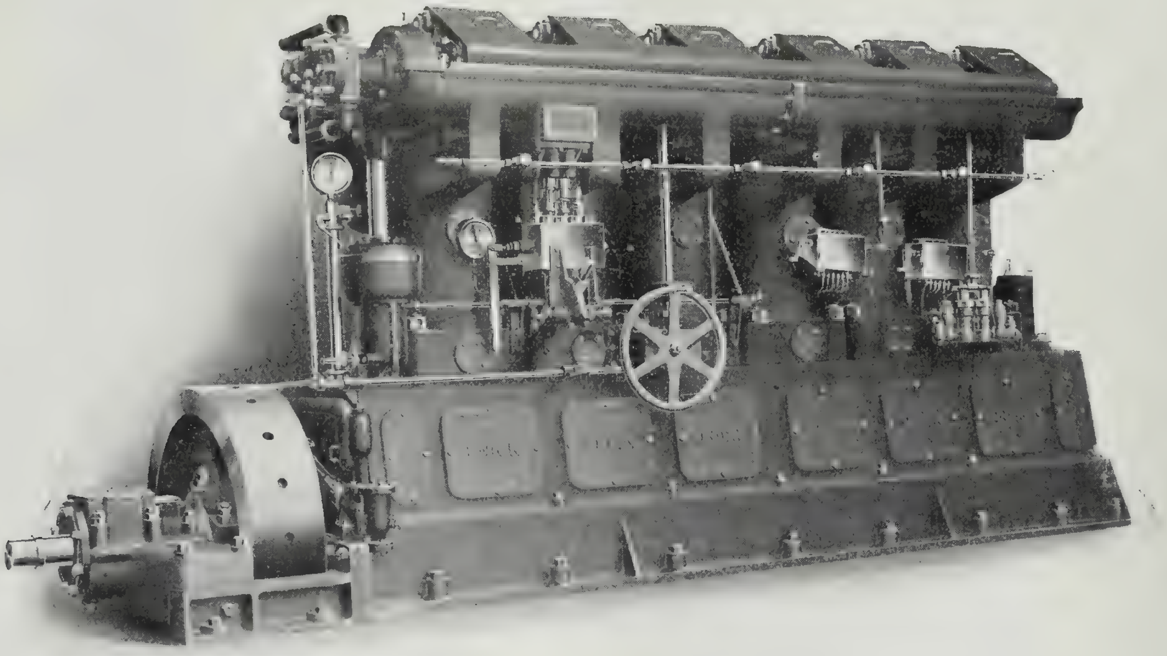

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The American Ship Florence in a Hurricane off Mauritius

THIS interesting sketch was made by her master---Captain Duncan, who is still hale and hearty, living in Illinois, and to whose courtesy we are indebted for the illustration. A complete story of the Florence appeared in Pacific Marine Review for November 1926.

They powered the *"Quillayute"* with Washington-Estep Engines

WASHINGTON IRON WORKS

The new 160-foot auto ferry "Quillayute" has begun her daily work of making five round trips (180 miles) from Edmonds to Port Ludlow on Puget Sound.
The power plant units selected were two 375 b.h.p. Washington-Estep Diesel Engines. These engines were installed in the "Quillayute" in seven days—a record for a job of this size.

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"WASHINGTON ESTEP" DIESEL ENGINES

AUGUST, 1927 Vol. XXIV, No. 8

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The National Magazine of Shipping

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Pacific American Steamship Association

576 Sacramento Street, San Francisco

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Official Organ
Shipowners' Association of the Pacific

James S. Hines,
President and Publisher.

Bernard N. De Rochie,
Vice-Pres. and Manager.

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Alexander J. Dickie,
Editor.

Paul Faulkner,
Advertising Manager.

The Seamen's Church Institute of San Francisco

THE Seamen's Church Institute of San Francisco is affiliated with the Institutes in other American ports through membership in the Seamen's Church Institute of America. Its purpose is to provide a mariner's church and a social club for the men of the merchant marine who are active in their calling, sober in their conduct, and honest in their ways.

The first knowledge of the Institute being at their service in a port comes to sailors from the visit of the chaplain. In the port of San Francisco the chaplain drives along the waterfront every morning of the week, visiting the new arrivals in port. After paying his respects to the captain he distributes folders telling the crew about the Institute and inviting them to make themselves at home at 58 Clay Street. When the new Institute is built, quarters will be provided for officers, engineers, and cadets. Now 50 per cent of the chaplain's ship visiting goes for naught because, so far as the use of the Institute is concerned, there is no place for the above named members of ship's personnel.

While on the ship the chaplain arranges for exchanging the library or supplying a first one if desired. In five years the library service has grown to be a very valued part of the Institute's ministry to the men of the merchant marine. In 1926 over 68,000 books were put on ships in over 1000 boxes. The reputation of this port for good libraries has grown so that many ships exchange their libraries exclusively in San Francisco harbor.

Seamen that come to the Institute use it to store their baggage and receive their mail. Over 2900 pieces of baggage were checked in 1926 and 16,336 letters were received for seamen. There are no bedrooms in the Institute but the men who care to stay are provided with a recreation room where games are provided and a reading and writing room. The recreation room is also used for church services, educational lectures, and entertainments, mostly moving pictures.

Over 50,000 men frequented the hall and attended these special gatherings, Sunday, Wednesday, and Friday evenings. Sailors in need of relief are provided with meals at the canteen and with beds at a near-by hotel. Twenty-one hundred and eighty-eight meals and 3,333 beds were furnished needy sailors in 1926. The more careful kind of seamen deposited money through the cashier's office. In 1926 $17,024.92 was deposited. An almost equal amount was withdrawn; $1719 was sent home. Three hundred and four cash loans were made to responsible men, and 479 articles of clothing helped "cover the naked." One hundred and one men were given employment. Forty-two missing men were located on request from parents or friends.

An enjoyable feature of Institute life is the half hour of chorus singing of old favorites after Vesper service each Lord's Day. Educational lectures, illustrated by motion pictures, are given by the chaplain every Wednesday evening, except in the summer time. Other movies and entertainments are supplied on Friday evenings by the superintendent. With larger quarters, more and better service could be rendered and more seamen would use the Institute.

A Recreation Hut is provided at the United States Marine Hospital, Fourteenth Avenue and Lake Street, San Francisco, which was used by 25,000 convalescent patients in 1926. Entertainments, games, reading and writing facilities are furnished at the hut. In the wards on Sunday afternoons the chaplain conducts services, assisted by the young people's societies of certain churches. He also visits two other afternoons each week. The social workers of the Institute visit in the wards every day, taking books and magazines to the bed patients, writing letters, running errands, and doing many things not provided for by the hospital. An important duty is helping the men adjust their claims and get their wages and keeping them out of the clutches of shysters and quacks. Old and disabled sailors are also assisted in getting into the Sailors' Snug Harbor at New York. A special worker provides occupational therapy work for bed ridden patients which helps occupy their time and brings them in some money. Five hundred and seventy-nine patients made 1060 articles in 1926.

The best of books and magazines are needed for use at the Marine Hospital as they are at the Seamen's Church Institute. Articles of clothing are also needed at both places. Readers of Pacific Marine Review are asked to keep these needs in mind and send in gifts to supply them or telephone Kearny 5144 and the Institute Ford will get your gifts for either the Hut or the Institute.

Shipping Board Profits

FOR the first time in their somewhat hectic history, the United States Lines' passenger service from New York to Europe, operated by the Merchant Fleet Corporation, showed a gross-net operating profit of $371,000 for the fiscal year ending June 30, 1927. Using the same method of accounting, the same lines showed an operating loss of $680,000 during the fiscal year ending June 30, 1926. This is a very good showing and is emphasized by the fact that there were included in last year's operating expenses some $500,000 expended for betterments and not ordinarily directly chargeable to a single year's operation. The figures also include some $264,000 of administrative expense for the Merchant Fleet Corporation. This is a very remarkable showing. It reflects economies in management and increases in net revenue aggregating over $1,500,000 in one year. We congratulate Brigadier General A. C. Dalton on this fine achievement.

These figures, however, are not an adequate foundation for the press propaganda which has suddenly sprung up around them, to the effect that the Shipping Board services are making money and in favor of continued government operation. Such a profit as is here represented would soon put any private operator in hands of a receiver.

The cost of the vessels in the United States Lines service, together with the cost of their equipment and of the offices and terminal facilities serving them, is represented by government bonds bearing interest at 4½ per cent. Figures for the vessels and their equipment alone aggregate, we are informed, $30,000,000. Taking this value as a basis, we figure that the United States is in reality paying out in interest on vessel value alone $1,350,000 a year in order to show a paper profit of $371,000. This interest is actually being paid out in cash on the Liberty Bond issues which made possible the past and present financing of the fleet operated by the Merchant Fleet Corporation. No provision is made in the accounting for depreciation and future replacement and less than 1½ per cent premium is charged for insurance.

Therefore the United States is still very much in the position of a majority stock holder facing an assessment and also facing the fact that his bond holders would be fully justified in calling for a show-down and forcing auction sale of the visible assets to protect their investment.

Henry T. Scott

HENRY TIFFANY SCOTT, for fifty years an outstanding leader in San Francisco industry and finance, passed away quietly at his home in Hillsborough on June 28 at the age of 81.

Henry T., as he was known to thousands of shipyard workers in the good old 'nineties, came to San Francisco in 1867 and got a job as shipping clerk in the old Union Iron Works at the corner of First and Mission Streets, where his older brother, Irving M. Scott, was already showing indications of becoming San Francisco's leading mechanical engineer. Henry T. had a genius for finance and soon worked his way up into the executive staff of the firm, so that when a reorganization was in order in 1875 he became a partner, and the firm was known as Prescott, Scott and Company.

In 1882 this company was persuaded to reorganize again for the purpose of pioneering steel shipbuilding on the Pacific Coast. This move resulted in the building of the Union Iron Works, Potrero Plant, now the Potrero Works of the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd. Henry T. Scott became president of the Union Iron Works in 1884 and held that position until 1903, when the firm was sold to a merger later taken over the Bethlehem Steel Company.

During the eighteen years of Henry T.'s leadership, the Union Iron Works was one of the famous shipbuilding plants of the world, and the fact that this plant could compete with Atlantic Coast shipyards and give a better job for less money was a constant source of amazement to marine engineers and shipbuilders. Everything that went into the ship was manufactured at the plant, which in many respects was better equipped than any shipyard in the world at that time. The financial genius of Henry T. Scott and his ability to organize engineering talent were the principal factors in making the Union Iron Works a successful going concern.

When the old Union Iron Works sold out, Scott became interested in the Pacific Telephone and Telegraph Company, and in 1906 he was made its president. A few years ago he was made chairman of the board of that $50,000,000 concern and held that position at the time of his death.

Henry T. Scott was a constructive builder of industries. He was one of the promoters of the Manufacturers and Producers Association, a director of several banks, director of the Crocker Estate Company, the Crocker Realty Company, and the Crocker Hotel Company. In many ways his influence has been used beneficially for the advancement of civic interests and many citizens will think of him in these connections.

But to those of us old timers who saw some of the tremendous work done in San Francisco during the closing decade of the last century, the death of Henry T. Scott marks the passing of that second generation of California pioneers whose labors bridged the gap between placer mining and modern industry.

Indomitable

E. D. TENNEY, former president and now chairman of the board of the Matson Navigation Company, is an outstanding leader among Honolulu's big business executives. The following clipping from the Honolulu Star-Bulletin indicates the high esteem in which he is held by his own home folk:

"One day, a little less than ten years ago, news came to Honolulu that one of the big Matson liners would be taken over to carry troops to France.

"America was in the World War, 'up to its eyes,' so was Hawaii. So was the Matson Navigation Company, trying to move a sugar crop—and sugar was an 'essential' in war as in peace—and having the experience of contributing one ship after another for transport purposes.

"E. D. Tenney was in The Star-Bulletin office telling of the requisition of the Matson steamers. He was asked, 'How are you going to move the sugar?' He replied, 'I don't know, but those troops will be moved if it takes every Matson ship. And the sugar will be moved if we have to do it in sampans!'

"We thought of that indomitable spirit, and the bit of determined, grim humor that accompanied it, when we read Mr. Tenney's dispatch concerning the Malolo immediately following her collision.

" 'We feel that now the Malolo has received her full baptism, fire, stranding, and collision, the three major accidents which can happen to a ship, and that from now on she will come into her own.'

"It was that spirit which brought Mr. Tenney from an unknown boy of eighteen, on a sugar plantation, to the head of great businesses, to the very forefront of business men of the Pacific. That spirit whch has contributed so much to Hawaii's almost magical development."

The Export Steamship Corporation

Henry Herbermann, President, Export Steamship Corporation.

THE Export Steamship Corporation of New York is two years old this month. This corporation, under the leadership of Henry Herbermann, its president, owns and operates the largest privately owned American flag fleet running between American North Atlantic ports and the Mediterranean and Black Seas. This fleet is composed of eighteen steamers, all freighters of the standard Hog Island type, 401 feet long, 54 feet beam, 32 feet deep, with a measurement of about 5000 tons gross, 3000 tons net, and a deadweight capacity of 7600 tons. All of these eighteen ships had been operated for the Shipping Board during the six years prior to their purchase by the Export Steamship Corporation and at the time of purchase they were showing a net operating loss of about $15,000 a round voyage.

When the Export Steamship Corporation bought these vessels at $7.50 a deadweight ton and contracted to run them in the same services under the American flag for five years, hard-boiled New York shipping men were amazed. Mr. Herbermann, however, after six years experience with these services had become convinced that, freed from government red tape, they could be made to show much better results.

During the first year, under private ownership, the Export Line had a total of seventy-two sailings, although it is only obligated under its contract to maintain sixty sailings. The average length of voyage was 11,000 miles and the fleet carried 400,000 tons of cargo eastbound and 250,000 tons westbound, principally Egyptian cotton, Spanish lemons, Grecian and Turkish figs and tobacco.

By efficient management and the application of tremendous energy in the personal supervision of every detail, Henry Herbermann has now ironed the red ink out of the ledger of the Export Steamship Corporation and is beginning to show some profit.

This enterprise should be encouraged by American shippers. It covers direct sailings from New York, Boston, Philadelphia, and Baltimore twice a month to western Mediterranean ports in Europe and twice a month to Malta, Alexandria, Jaffa, Beirut, and Piraeus, calling for westbound cargo at Greek ports and Smyrna; once a month to Mediterranean ports in Africa, and once a month to Black Sea ports.

These eighteen modern steamers are carrying the American flag and American trade and American ideals into the historic sources of the world's maritime trade, into those ancient lands and seas from which our Tyrian heritage first sprang. All good American exporters should strain a point or two to give preference in their shipping to this all-American institution which is going over the top with such splendid courage and such worthy ambition.

Pacific Wage Handicap

Deck.	U.S.	Number ofmen	JAPAN	NUMBER Of men
Master	$ 290	1	$ 98	1
1st Mate	185	1	63.70	1
2d "	165	1	46.55	1
3d "	150	1	41.65	1
Carpenter	80	1	25.48	1
Bosun	75	1	27.93	1
A.B.s	437.50	7 @ $62.50	140.63	7 @ $20.09 ea.
Ord.	142.50	3 @ 47.50	55.86	3 @ $18.62 ea.
Radio	105.00	1	51.45	1
	$ 1630.00		$ 551.25	
Engn.Room				
Chf. Engr.	260.00	1	88.20	1
1st Asst.	185.00	1	49.00	1
2d "	165.00	1	41.65	1
3d "	150.00	1	31.85	1
Oiler	217.50	3 @ $72.50	70.56	3 @ $23.52
Firemen	202.50	3 @ 67.50	67.62	3 @ 22.54
	$ 1180.00		348.88	
Stewards Dept.				
Chf. Steward	120.00	1	26.95	1
Chf. Cook	100.00	1	22.05	1
2d "	80.00	1	----	
Messboys	126.00	3 @ 42.00	61.74	3 @ $20.58
	$ 426.00		$ 110.74	
TOTALS	$ 3236.00		$1010.13	

In the July issue of Pacific Marine Review we published some figures compiled by Norman F. Titus from Shipping Board records, showing the operating differential which handicaps American ships in the foreign trade. These figures moved Captain Dollar to send in the tabulation herewith, which shows the difference in monthly wage cost between the crew of an American vessel and the crew of a Japanese vessel in the transpacific trade. The figures are for a 10,000-ton freighter.

Pacific Grain Charters 100 Per Cent British

IN reading the list of fixtures made during the month of July on the Pacific Coast, we were impressed with the scarcity of American flag ships in the list. Out of a total of 54, the various flags were represented as follows: British 29, Japanese 10, Norwegian 8, American 4, Danish 1, Italian 1, and one unknown. Twenty of these vessels were chartered to carry American grain from the Columbia River or San Francisco to United Kingdom and Northern Europe. One hundred per cent of these are British.

"Don't Give Up The Ships"

An Analysis of the Present Situation in the American Merchant Marine

**By Ira A. Campbell, General Counsel,
American Steamship Owners' Association**

Foreword & Comment

The problem of the merchant marine to the business community of the United States, especially to that part of it engaged in foreign trade, is of perennial interest and calls insistently for concrete suggestions looking toward its solution.

This paper by Ira A. Campbell, general counsel of the American Steamship Owners' Association, cites some of the underlying causes of uncertainty in the present situation so lucidly and fairmindedly that it should be read by all those who are vitally interested in the present transitional state of our merchant marine.

It was delivered as an address at the Fourteenth National Foreign Trade Convention at Detroit where its logical and forceful demonstration of present shipping conditions evoked widespread comment. It is with pleasure, therefore, that the Council places this address at the disposal of the general foreign trade community.

I want to emphasize the very able address given you by Mr. Campbell, and to say this, to impress it on your minds, and to get every one of you here to help in this one thing, to get the Congress of the United States to put us poor shipowners on an exact equality with our foreign competitors. If they will do that we will give the American nation a merchant marine worthy of the name.

CAPTAIN ROBERT DOLLAR.

THE phrase is high sounding. Applied to the present situation in American shipping it means "Do not desert private shipping," for if those who are making serious efforts and venturing their capital to operate successfully their own ships in foreign trade are not given material and moral support by American business interests and by the government, the hope of an American merchant marine to serve this country adequately in the advancement of its foreign trade will be gone, because a government owned and operated merchant marine can never be successful. By that I do not mean that the government can not run ships. Of course it can, so long as the people are willing to pay the cost. But the operation and maintenance of a successful merchant marine is something more than merely keeping ships ploughing the seas.

I sound the warning because, unless plans in the making by the Shipping Board are checked, we are headed for permanent government ownership, and private shipping is doomed.

The value of a merchant marine in foreign trade lies in the aid which it gives to the development of the country's commerce and to the national defense.

As for national defense, all naval and shipping men know that the United States possesses and has in operation, in its coastal, intercoastal, and foreign trade fleets, and in its oil tankers, all the ships necessary to adequate defense, unless this country desires to keep up an emergency fleet sufficient to transport another large expeditionary force overseas—something no one has had the temerity to suggest, for it is wholly incompatible with our active naval policy and our peaceful purposes. As an auxiliary to the navy and for the defense of our shores, we have and will have an adequate merchant marine.

We are, therefore, presently interested in American shipping from the point of view of its aid to our foreign trade.

I say foreign trade because there is no problem in our domestic maritime trade that will not ultimately be solved by the inexorable law of supply and demand. Freight rates can be and will be adjusted in that trade to insure a proper return on invested capital, and a replacement and enhancement of tonnage, whatever the cost of operation and shipbuilding, because the domestic trades are protected against foreign competition both in construction and in operation.

Operating Differentials

It is this factor of foreign competition which makes the operation of American built ships so difficult and in many foreign trades impossible without the support of the government. Competition with the lower standards of living of the maritime nations of the world, reflected in building and operation costs, are the principal factors which create almost insurmountable obstacles to America maintaining a successful merchant marine in foreign trade.

A careful study, made from ships' and government records, shows varying differentials in the costs of construction and operation, in favor of foreign as against American ships, depending on type and size of ships. Including interest, depreciation, insurance, and operating costs, these differentials range from 5 to 9 per cent per annum on the capital cost of the American built ship, according to the Shipping Board.

These figures are, of course, generalizations, but they show that differentials exist, and are basic factors to be reckoned with in laying down any plan for successful ownership and operation.

But they are not the only factors; there is at least one other, the apathy of American foreign trade interests towards American shipping; the failure of the American business man to patronize American ships. This, however, can be overcome, if proper effort is made.

It is the belief of many shipping men of experience that, with the government aids available the problem is not hopeless. But to accomplish this there has got to be a marked change in the attitude, first, of government officials, particularly the Shipping Board; and second, of American business.

Present Situation

Now what is the situation and how can the change be wrought?

The Shipping Board has done excellent work in many particulars. It has gone far towards establishing a privately owned merchant marine. After the war the Board found itself in possession of more than 1500 ships of all types, designs, and classes, and following the enactment of the Merchant Marine Act, 1920, it established approximately eighty services from all of the principal ports of the United States. It placed the operation of the vessels in private hands under the only form of operating contracts then found practicable.

Today, it has brought about private ownership in the majority of the services most essential to the development of our foreign trade, particularly to those world markets to which America looks for greatest advancement in her trade interests, namely, South America and the Orient.

The Shipping Board has sold and there are now being privately operated the following services:

(1) From the Pacific Coast to the west coast of South America by the Grace interests, long established therein, four large cargo vessels purchased from the Board, and one not so purchased.

(2) From New York to Rio de Janeiro, Santos, Montevideo, and Buenos Aires by the Munson Line, four large combination passenger and freight ships.

(3) From the Pacific Coast to the east coast of South America via the Straits of Magellan and home via the Windward Islands and the Canal, by the Pacific Argentine Brazil Line, six large cargo ships, which have now been equipped with small passenger accommodations.

(4) From the Atlantic Coast to the West Indies and Colombia by the Columbian Steamship Company, seven cargo ships.

(5) Round - the - World by the Dollar Steamship Line, seven combination passenger and cargo ships, the finest around-the-world service that has ever been maintained under any flag.

(6) From California to the Orient by the Dollar interests (California Orient Line), five large combination passenger and cargo ships.

(7) From Puget Sound to the Orient by the Dollar interests (American Oriental Mail Line), five large combination passenger and cargo ships.

(8) From the Atlantic Coast to Mediterranean ports by American Export Lines, nineteen large cargo ships; and

(9) From the Atlantic Coast to south and southeast African ports by the American-South African Line, five large cargo ships.

In addition to the foregoing, the following American steamship companies are operating in American and foreign trade the number of ships sets opposite their respective names:

Name of Company	No. of Ships
American and Cuban Steamship Co.	8
Atlantic Fruit Co.	7
Atlantic Transport Line	1
Barber Steamship Lines, Inc.	3
Bliss, Dallett & Co. (Red D Line)	7
Grace Line	12
Isthmian Steamship Line	35
Matson Navigation Co.	3
Moore & McCormack Co., Inc.	6
Munson Steamship Line	24
New York & Cuba Mail Steamship Co.	11
New York & Porto Rico Steamship Co.	2
Nosa Line	3
Panama Mail Steamship Co.	6
United Fruit Co.	24

In other words, we already have a splendid merchant marine in most of our essential foreign trades. These services are in the hands of experienced energetic American shipping men, endowed with an American pioneer spirit of adventure, enterprise, and determination. Can they hold on and win in the long run? Yes, if they have the support and backing of their Government and American business men. But if they do not, they will fail. And about the surest way to produce failure will be to have the government enter upon a new and widespread plan of new construction and government ownership and operation, such as is in the wind today.

The Shipping Board showed splendid business judgment in reducing the prices at which the ships in these services were sold, for they lowered the owners' investments not only so as to eliminate the differential in capital costs, but to offset in large part the differentials in operating costs.

But this alone was not enough. These same services had to have government aid through mail contracts. And again the Shipping Board, appreciating the necessity, acted promptly and with vigor, and succeeded, in co-operation with the Postmaster-General, in obtaining the necessary appropriations here.

What is the result? We have the nucleus of a privately owned merchant marine to the greatest markets of the world, which adequately serves our needs, and gives promise of permanence, if the government acts with business wisdom.

Present Trends

But a change is in the air, and unless it is checked before it gains headway, it will destroy the good work the Board has accomplished, and damn the future of American shipping. We cannot have both the government and its citizens permanently in the shipping business and either succeed.

We are facing two problems today in our aspirations for a place on the seas; one to hold and develop what we have, the other to bring about private ownership in the other essential service.

The Shipping Board is now operating nearly 350 ships in 23 different services. Are these all essential? The Shipping Board says yes by the mere fact of their maintenance regardless of loss.

But there has never been any adequate determination of this question. Have you ever heard of any special and through inquiry into each of the various services now being operated at a heavy loss to determine their necessity to the country? The ports out of which they operate seem to want them continued whatever the loss to the country, because they profit by them. The politicians want them, because so long as the Shipping Board will continue them at the country expense, they will get political credit at home. And the operators want them because of the profit made out of commissions.

These have been largely the influences that have kept some of the services going.

The Merchant Marine Act, 1920, set up the plain business test of making the services pay, as a condition to their continuance by the government.

Section 7, after authorizing the Board to sell or

(Continued on Page 11, Advertising Section.)

The Silent Revolution in Transport and Trade

Accelerated Speed in Movement of Commodities a Necessity in the Financing of Modern Merchandising

**Norman F. Titus, Chief, Transportation Division,
Bureau of Foreign and Domestic Commerce**

THE industrial revolution of 1832 was violent and acute distress was occasioned by the displacement of the domestic method of production by the factory. Just as remarkable a revolution is now taking place in business, but its changes are silent and orderly. Five years ago, the retailer ordered by the gross; now he purchases but one twelfth of a dozen. This new method of business means, for the retailer, smaller stocks on hand and more rapid turnover; it also means more rapid adjustment to demands of style, which is an increasingly important factor in American retailing. With the manufacturer, this new business method has produced astonishing changes; in his operation, there is likewise a remarkable reduction in the size of the business transaction; his volume is great, but made up of an infinitely greater number of small orders. It is true that this piece-meal method of doing business has increased the costs of accounting and shipping, but it has its advantages in enabling the manufacturer to purchase raw materials more accurately and has eliminated the curse of cancellation of large orders that were formerly the bane of manufacturing. The closer margin of operation permits of adjustment to changes of financial conditions; with a decrease of ordering, a manufacturer can rapidly adjust his purchases of raw material and his plant operation. The leaders in manufacturing assert that the advantages of the new method of doing business outweigh the disadvantages; for the retailer, the results are largely beneficial.

Revolutionary changes are not confined, however, to merchandising; quite as remarkable effects are noted on the farm and in certain angles of foreign trade. In all aspects of American business, the impelling force is the accelerated movement of commodities.

In the rural districts, the big problem confronting the railroads, bankers, and merchandise handlers is coping with the situation caused by the very much accelerated movement of commodities from the harvest to the channels of trade. During the past few years there has been an improvement in harvesting machinery with the result that time from harvest to trackside has been cut five to thirty-five days, depending upon the commodity and local conditions. This speeding-up process has been aided further by motorization and good roads, until it now affects all parts of the system of distribution. The railroads are the only part of the distribution organization which has recognized and met this accelerated movement; the financiers, bankers, and merchandise handlers are just beginning to comprehend the true meaning of the change. A more complete knowledge and use of storage, with financing of warehouse documents, will be undoubtedly an important step in keeping pace with this situation.

Acceleration of Trade

The acceleration of trade has manifested itself even in the export field. Five or six years ago, grain and flour were sold generally on a requirement for a two months' delivery in European markets; now the arrangement is usually for a delivery in about two weeks. These demands have wrought unexpected changes in many ways. Buffalo has supplanted Minneapolis as the premier flour exporting city, because twenty-four hours after an exporter has booked an order Buffalo flour can be delivered alongside ship in New York, an obvious impossibility for a Minneapolis miller. Furthermore, New Orleans' cheaper rate by water from St. Louis cannot supplant the higher rail rate from Kansas City to Galveston; the export of grain through Galveston is much greater than New Orleans because the demands of accelerated delivery will not permit a greater use of the Mississippi barge line.

The cumulative effect of this acceleration of transportation has been to reduce stocks on hand and speed up business generally. These factors have had almost a revolutionary effect upon business; so much so, in fact, that whereas our attention was formerly almost entirely devoted to the perfection of production, it is now focused very largely upon the problems of distribution. As the improvement in transportation has been largely responsible for this business transformation, it is a matter of extreme importance to examine the factors that have made this result possible and to note the present tendencies in the light of their influence upon the future.

Transportation Improvements

In 1926, the daily movement of a freight car averaged 30.4 miles as compared with 22.4 miles in 1921. Gross ton miles per train hour during these two periods rose from 16.555 to 20.705. The amount of coal consumed per one thousand gross ton miles has decreased from 185 lbs. to 155 lbs. between 1921 and 1926. Class 1 railways in 1926 originated over a third more freight than in 1921, but employed less than one-twelfth more men to handle the increased traffic. No mention is made now of car shortages, but instead attention is called to high car surpluses. Only five years ago the average daily car shortage aggregated 138,500 cars. Revenue freight ton mileage has increased from 310,000,000,000 in 1921 to 444,000,000,000 in 1926.

Not only have the railroads performed marvels in the improvement of their equipment and their transport records, but they have been equally as successful in the care and custody of the freight entrusted to their care. In 1921, the claim bill of the railroads of the United States was $120,000,000; in 1926 this loss was reduced to $38,000,000 and the railroad officials stated that they felt they were just beginning in this great field of freight protection and were determined to reduce the latter figure by one-half.

Every three months a forecast of cars required for each of the thirteen districts, into which the country has been divided, is obtained through the organization known as the Shippers' Regional Advisory Boards. These forecasts have enabled the railroads to determine the kind and amount of equipment necessary for the carriage of seasonal and the regular moving freight in the various sections of the country. The work of the Advisory Boards has been an important cooperative activity in the speeding up of railway transportation.

Regional Advisory Boards

Thirteen Shippers' Regional Advisory Boards have been organized by the American Railway Association. The members of these boards include representatives of production, distribution, consumption and finance. They are voluntary public organizations representing a territory of common business and transportation interests. Their purpose is to promote the economic and transportation welfare in each territory and to assist the railroads individually and collectively in the settlement of questions of car requirements and service. Each board is organized by commodity groups, with a chairman, vice-chairman, and as many members as necessary to cover adequately the commodity for the district included in the board territory.

Speaking before the Atlantic States Regional Advisory Board the fifth of April, 1927, Secretary Hoover, commenting upon the importance of the cooperative activities of the shippers' organzations, said:

"One of the reasons for the stability in our price levels has been the fact that goods move quickly, and that there is not the stimulus to rising prices and the pyramiding of orders that come about in the face of any suspension of ample transportation.

"In the installation of these boards, the proof that it is possible for people of opposite interests to get together and arrange their own problems and settle their own troubles, you are making a demonstration that has a far greater and more far-reaching importance than perhaps the actual acts that you perform at these meetings, because you are demonstrating that it is possible that we can carry on this enormous commerce by cooperative action within our organization itself, and outside of the government.

"Self-government is not solely a question of the election of representative officials. It is a question of self-government by the individual and by the industry outside of the government. True self-government is the minimum of government; and you gentlemen are making a contribution to a fundamental thing in our whole social and economic system today in conferences of this type and in organizations of this sort."

The public organizations, known as the Shippers' Regional Advisory Boards, were organized principally during 1923-1924. During these two years shippers' organizations were set up in ten districts of the United States, beginning first with the Northwest Board at a meeting in Minneapolis, January 6, 1923, which was followed by the organization of the Southeast Board, May 11 of that year. The last board organized was the Alleghany Shippers' Advisory Group, November 3, 1926. It is estimated that the membership of the various boards approximate 18,000, comprising the principal shippers, receivers and bankers, having to do with the movement of freight throughout the United States.

Objects of Advisory Boards

The objects of the Regional Advisory Boards are probably best set forth in the Trans-Missouri-Kansas Shippers' Advisory Board minutes:

(1) "To analyze the transportation needs of the territory and assist in obtaining cars and transportation service necessary for these products.

(2) "To afford a meeting ground between shippers and receivers where their interests may be considered and their differences speedily settled.

(3) "To promote a better understanding between the carriers and the shipping public of their relations and obligations to each other.

(4) "To study production, markets, and trade channels, and promote a more even and efficient distribution of the products of this region.

"The Shippers' Advisory Boards, born in a period of transportation difficulty and primarily intended as a method of adjusting complaints, have grown through a period of generally good service into a compact organization, striving constantly to correlate in practical ways the economic processes of distribution. Through these Boards the public becomes a partner in the business of railroad operation. Their continued successful functioning is the most significant and hopeful element on the railroad horizon."

Benefits from Advisory Boards

The activities of the shippers' boards have to do not only with forecasts of car requirements, but also with problems of loading and unloading of cars, problems of better use of the railway equipment and economic analysis of distribution as related to transportation. Some examples of resultant expedited service follow:

A large oil company in Ohio states that "Due to the prompt and reliable service we had, we were enabled to return some 200 leased tank cars to the owners the first of last year, resulting in an annual saving of over $100,000 to their company." A prominent automobile company estimated its average reduction of inventory from 40 to 10 days. A large paper company states that

Efficient modern waterside warehouses are one of the factors in accelerating commodity movements. Above are shown two recent acquisitions along this line on the waterfront at San Francisco. At left, the wholesale grocers' warehouse of the Southern Pacific Company; and, on the right, the transit warehouse of the Board of State Harbor Commissioners. The latter provides for four additional floors when necessary.

because of the speedy transportation service it was unnecessary for its patrons to carry large stocks as was previously necessary.

A well-known electric supply house has stated that it has reduced its inventory about one-third due to the reliable railway service now received. A leading department store in the Middle West has stated that with an average stock of $1,000,000 less than in the year before it does considerably more business, giving the credit to better transportation, stating further that the interest on the reduced inventory paid its entire freight bill for that year.

In Pennsylvania, leading manufacturers reduced their steel stock to one-fourth of what it was previously and other materials were reduced one-half. One furnace estimated reduction in car transit to 45, where 75 were previously required. A manufacturer in the Southwest previously borrowed annually $400,000 from his bank to carry material in stock. Now, through the dependable railway service, he is able to carry on his business entirely independent of loans. In the mining field, a copper producer has stated that the reduced time in transit from an average of 27 to 13 days has represented a saving to him that goes far toward paying his entire freight bill.

It is estimated that during the last four years stocks of lumber throughout the country have been reduced to such an extent that approximately $600,000,000 have been reducible from stocks and accounts in the lumber industry.

Dr. Duncan of the Association of Railway Executives, in an article in the Harvard Review, stated: "For the country, as a whole, the reduction in average time of transit via the railroads has been variously estimated from 25 to 40 per cent." Where it formerly took from 18 to 20 days to bring a car of oranges from California to New York City, the shipper and receiver may now depend upon eleventh morning delivery, and frequently upon the ninth or tenth. Such improved service, quicker loading and unloading of cars, is extremely important. It is estimated that a box of oranges in good condition sells for one-half again as much as a box showing 10 to 15 per cent decay. This means considerable to the grower of perishable produce in the United States.

Forecasts Available

From time to time, during the past two years, statements have been made suggesting that we might expect a period of depression and that forecasts taken from the stock market and other sources pointed to this end. In the face of these forecasts, the prognostications of the Regional Advisory Board Commodity Committees indicated greater business activity and increased carloadings. The depression did not become a reality. Stimulation and business activity did result. The year 1926 was one of good business, fulfilling the prophesies of the quarterly estimates by the Regional Advisory Boards. It is noteworthy that the estimates of the Boards and the actual carloadings varied less than 1 per cent in many instances.

In February, 1927, there was proposed a regional commodity forecast comprehending each of the thirteen advisory board districts. In order that the national survey might be complete and be used promptly, it was necessary that the board meetings coincide with or be slightly in advance of the quarterly calendar period. Before many months, there will be available for the general public a national commodity forecast for the United States by districts, based upon the commodity committee car requirement statements.

The usual proceeding for a commodity committee in making its report of the estimate carloadings for the coming quarter is for the board chairman to ask if there are any complaints in the handling of the commodity during the past quarter. Questions of clean cars, prompt spotting of cars and items of service are discussed. Frequently, the carriers are questioned as to why there have been delays in the return of empty equipment to certain localities.

When the General Manager, or operating Vice-President, of a railroad is questioned by the shippers in the presence of other railroad and shipping representatives, a better understanding between the carriers and the shipping public in their relations and obligations to one another is bound to result.

In 1926, the Pacific Coast Regional Advisory Board, comprising the states of California, Nevada and Arizona, instituted a grape car plan for the movement of grapes from California to the eastern market. Success marked the operation of the plan; cars moved reglarly, and no shortage developed. It is believed that this experiment may mean a new era in the formation of various agricultural organizations to market perishable and seasonal produce.

In cooperation with the Florida Division of the Southeast Advisory Board, the Department of Commerce made a Transportation Field Survey of Florida in 1926. The department is now assisting the Central Western Advisory Board with a warehouse distribution survey. The cooperative Bureau of Foreign and Domestic Commerce, when requested, endeavors to assist and promote transportation and commerce through the medium of the Regional Advisory Boards. Many times it is found that difficulty arises in determining or collecting certain kinds of data. A government agent may be given the individual returns; he then reports back only the totals for the region or district as a whole. This sort of federal assistance has been found generally helpful as it respects the confidence of the individual.

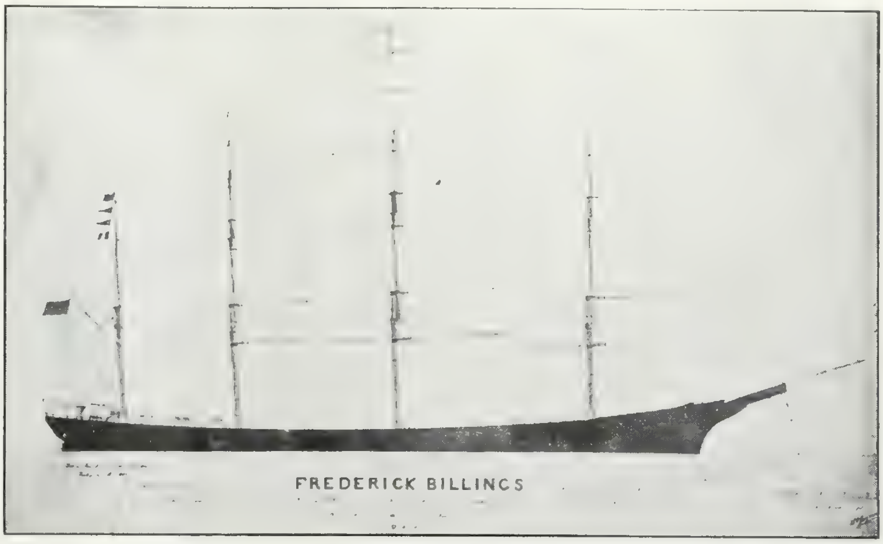
In the foreword to the Florida Transportation Field Survey, Dr. Klein, Director of the Bureau of Foreign and Domestic Commerce, stated:

"In completing this survey it is believed that the bureau has worked out on a practical basis a plan of cooperation when the industries involved need only the assistance of a cooperative Government agency to carry forward their plans. This example may be of considerable interest to other regional or district organizations throughout the country."

All of these factors have contributed to the remarkable achievements of the railroads during the last five years; and it has been this success of the railroads that has made possible "the silent revolution in transport and trade." The world supremacy of America in industry has been due to the perfection of production; the next few years will witness equally as astonishing results in the field of distribution.

The American Ship Frederick Billings

By F. C. Matthews



(From the original in Sailors' Home, Bethel, Copenhagen.)

The Frederick Billings drawn to scale.

THE three-decked, four-masted ship Frederick Billings was built at Rockport, Maine, by Carleton, Norwood & Company and was launched in August, 1885. Only the best material obtainable was used in her construction, and her rating was that of the highest class for wooden ships, A-1 15 years. Length for measurement, 278 feet; beam, 44:9; depth of hold, 29 feet; height from keel to main deck, 30 feet; registered tonnage, 2497 net; carrying capacity, 4000 tons, deadweight. The main mast was 90 feet long and the main truck towered to a height of 180 feet above deck. There were 820 yards of canvas in the main course and 160 yards in the main skysail, their respective yards being 90 feet and 40 feet long. The spanker or jigger mast was fore and aft rigged.

Her managing owners were Carleton, Norwood & Company. Her first master was Isaac W. Sherman, who had a small ownership in the ship.

The Frederick Billings was built for the California trade and practically all her sea life was spent in the run between San Francisco and New York or Europe. Her maiden voyage was advertised to be from New York to San Francisco but these plans were altered and a charter for case oil to Japan accepted instead. Her first appearance at San Francisco was on June 17, 1886, when in continuation of this first voyage she arrived from Kobe in ballast, passage 29 days. Then after loading a full cargo of wheat she sailed July 13 for Havre and made that run in 112 days. After discharge she proceeded to Cardiff, loaded 3600 tons of coal for San Francisco, and made the passage out in 126 days, arriving May 21, 1887. She then went to Liverpool with 3920 tons of wheat in 123 days; thence back to San Francisco with 3700 tons of coal in 122 days; thence to Seattle and back to San Francisco with 4100 tons of coal, arriving July 7, 1888, 6 days on the run down.

She sailed from San Francisco August 25, 1888, and was 117 days to Havre with wheat. Crossed to New York and then back to San Francisco in 145 days; thence to Liverpool in 132 days; thence New York to San Francisco in 135 days; thence 115 days to Havre. The Frederick Billings repeated her previous performance of 135 days from New York to San Francisco, returning direct to New York in 110 days. She left New York on her last Cape Horn passage November 20, 1892, and arrived at San Francisco April 5, 1893, a run of 136 days. From there she went to the West Coast of South America where she was burned.

As will be seen from the figures given, the sailing record of the Frederick Billings is very good for the class of large carriers. The average of her passages from San Francisco to Atlantic ports is 118 days in spite of the, for her, long run of 132 days in 1889. On that occasion she encountered nothing but unfavorable winds and had no trades to speak of. She was 28 days from San Francisco to the equator; 32 days in the South Pacific; 35 days in the South Atlantic; 37 days from the line to Liverpool. Her westward passages average 133 days and, according to their various memoranda, were generally made under adverse conditions of wind and weather. On the longest, 145 days in 1889, Captain Sherman reported his passage as the most trying one he had made during his forty-six years as a shipmaster. For 55 successive days nothing but head winds or gales were encountered and 36 days were required on the run from the equator to the Golden Gate.

On October 31, 1891, the Frederick Billings left New York bound for San Francisco. At 2 p. m., November 6, in a moderate breeze from the southward, with rain, the weather looking squally, the royals were ordered clewed up. Three men were on the fore royal yard and three on the main royal when a squall struck the ship and the starboard backstay gave away. The fore and main topmasts immediately broke off at the eyes of the rigging and, with everything above them, came down with a crash. Five of the men on the royal yards were never seen thereafter. The other saved himself by catching some of the rigging and escaped with a few bruises. The jibboom broke off short in the cap and the ship could not be worked in the heavy sea then on. After the squall had passed, spars and sails were cut away and the wreckage finally cleared. Work was prosecuted night and day on new spars and a week after the accident a main topmast was sent up. Two days later the main topgallant mast was completed and sent up and work was started on the spars of the foremast. The ship fell to leeward of Cape St. Roque and a week was spent beating to get by. By the time latitude 20 South was reached the fore and main skysails were ready to be set and the ship looked as if nothing had happened. Had it not been for a donkey engine which Captain Williams had put aboard for hoisting purposes just before the ship's departure on this voyage, the refitting could not have been accomplished at sea and a return to New York for repairs would have been inevitable.

On May 9, 1893, the Frederick Billings left San Francisco in company with the Henry B. Hyde to load nitrate, the Billings arriving at Taltal in the lead. The ship was ordered to Pisagua to load for Hampton Roads, and 3800 tons of nitrate were taken aboard in eight working days, the quickest dispatch received by a ship at that port up to that date. On July 29 the lading was completed and the ship was to sail the following morning, Sunday. At 9 o'clock that evening the captain was in his cabin writing up his accounts when the watch on deck reported a fire forward. Almost immediately a series of terrific explosions followed, blowing up the decks and blowing out the sides of the ship. Twenty minutes after the alarm was given there was nothing left of the vessel but a mass of floating wreckage. The captain left in the dinghy whose other occupants included the chief mate's wife who had been stewardess. All the other hands were rescued by boats from different ships after a number of sailors who had been unable to get aft, had jumped overboard from the jibboom. A consular investigation at Iquique failed to establish responsibility of the crew for the fire and its origin was never determined. It was claimed that the crew had received brutal treatment on the passage from San Francisco and that, while at Pisagua, they were only prevented from deserting by the alertness of the boatswain who had been told off as night watchman.

Captain Isaac W. Sherman of Camden, Maine, the first master of the Frederick Billings, continued in the ship until 1890, when he sold his interest and retired from the sea. He had begun sea life as boy cook on his father's vessel and in 1843 took his first command, the coasting schooner Brilliant, 118 tons. Later he commanded vessels of different rigs, some of his ships being the Art Union, Bennington, Success, and Raphael. During his career as master for 47 years, Captain Sherman never lost a vessel.

His successor in the Frederick Billings was Captain H. H. Williams, prominent as a merchant navigator in connection with the well known ship St. Paul. Captain Williams was in the Billings when she met her fate although he had not taken her from New York to San Francisco on her last voyage over that course. On that trip he had been temporarily relieved by Captain W. H. Freeman. When the ship was on the equator Christmas Day, 1892, 35 days out from New York, Captain Freeman died of heart disease and was buried at sea. Chief Mate Meady completed the passage, and after Captain Williams arrived at San Francisco to resume his command, he returned to his former position as mate. Mr. Meady was considered thoroughly competent and efficient and while a strict disciplinarian, was withal humane and well liked by his crews. He was the last officer to leave the wreck of his ill-fated ship.

Ross Shire Passing Kentmere

WHEN talking recently to our publisher, Mr. J. S. Hines, about the many trips he had made into the port of San Francisco, Captain Andrew Baxter of New York related an interesting incident that happened on a voyage from Portland, Oregon, to Hamburg many years ago in the British steel sailing ship Ross Shire.

The British ship Ross Shire, Captain Andrew Baxter, passing the British ship Kentmere at sea.
(From a painting by Captain Andrew Baxter.)

Captain Andrew Baxter has rounded Cape Horn as a master of big sailing vessels twenty times. He is also noted as a marine artist of parts. On the particular voyage in question, the Ross Shire had left Portland some days after another ship, the Kentmere, bound on the same voyage. One of the then crew of the Kentmere was Charles Robert Patterson, who has since achieved national fame as a marine artist. In an interview given to the Boston Transcript in 1923 Patterson gives the following particulars regarding this voyage:

"When the Kentmere was off the Azores or Western Islands, as seamen call them, she struck a heavy westerly gale. It was blowing hard and there was such a sea running that, though it was a fair wind, the crew came aft and asked the captain to heave to. When one considers that seamen of that day were used to heavy weather, which meant tons of water on deck and sleeping in wet clothing and blankets with inches of water washing over the deckhouse floors, it is evident that there would have to be a pretty bad sea before the crew would make this request. The captain gave in and the Kentmere rode out the gale that night under three lower topsails.

"The next morning it was still blowing hard, with a clear blue sky, and at 5:30 they put the ship away before the wind again and started to make sail. Pretty soon a big vessel was sighted off on the weather quarter, coming along a noble sight in the morning sun with every stitch of canvas set.

"When the Kentmere reached Hamburg, some days after, she moored just astern of the Ross Shire, with her bowsprit poked over the Ross Shire's stern, but it was not until many years later that Mr. Patterson met Captain Baxter, who recalled that morning to him and remembered perfectly passing the Kentmere but simply said that he wanted to get to Hamburg in under one hundred days, and that he was driving her. Captain Baxter was noted as a sail-carrier and the Ross Shire made that passage to Hamburg in ninety-six days."

Reading Between the Lines

Some Lessons Learned in the Manufacture and Distribution of Wire Rope on the Pacific Coast

By Martin H. Gerry,
Purchasing Agent, E. H. Edwards Company

PSYCHOLOGY teaches us that one of the strongest instincts of man, like all animals, is the instinct of self preservation. We see it practised every day of our lives regardless of what vocation we follow and we see it evidenced in many forms. The old "buck passing" game so common in some concerns is but an out-cropping of it in a common form. As purchasing agents, therefore, we receive our share and must take steps to forestall the efforts that sometimes make it appear that our purchases are to blame for things that really amount to lack of knowledge, carelessness or mistakes on the part of others.

The writer has found in his experience that very often complaints registered against commodities that he has purchased can be traced to other causes than failure on the part of the manufacturer of the commodity. As a result he has learned not to take snap judgment until he has found the full facts of performance and the conditions under which the commodity was used. And until all the facts are in and the full conditions known it is not fair to condemn a purchasing agent for his selection of material or the material itself. In obtaining these facts on performance even though they may have taken place in our own plant or organization, we have found that the wide awake intelligent representative of the manufacturer can be of immense service.

A real find for the purchasing agent is the manufacturer that turns out a high-grade article at the right price, maintains an active service program that follows the performance of its equipment after the sale is made and whose salesmen and engineers really know their product and its application.

The writer has taken special interest in selecting his own purchases from organizations that as nearly as possible approach this ideal, and in noticing how the intelligent service policy of such companies has lessened the "buck passing," increased the efficiency and bettered the costs.

Much of the writer's interest in the policy and attitude of the companies from whom he buys has been caused by close association with the aggressive sales and service policy of his own company. This contact has given him both sides of the picture, and he has been fortunate in being behind the scenes in a number of cases that have shown him what it was possible to accomplish in the way of service to customers and improvement in the product to meet changing conditions.

Service work is most important to all mechanical lines and though not generally recognized it is equally necessary in the case of wire rope which in itself is a bit of mechanism—made up of working parts. Individual wires form the strands, strands surround a hemp or wire core—in service all are constantly working on one another and at the same time meeting external wear.

No piece of machinery is subject to more severe use or abuse than wire rope. Overstrain, abrasive wear, lack of lubrication, action of the elements, improper equipment, and careless handling, combine to present a real challenge to the manufacturer to make a product that will operate with the greatest efficiency. To accomplish this end means constant vigilance in the manufacturing and equally constant vigilance in the field.

From this field service work of the trained, aggressive sales engineer comes the real benefit to the customer and incidently the smoothing of the purchasing agent's path.

Development of new equipment, and methods of using rope, and detecting unusual operating conditons, are the chief things to be borne in mind by our men in their service work.

Unusual operating conditions have to be handled delicately and the facts presented to the superintendent or purchasing agent of the customer in a diplomatic manner. Often the difficulty lies in the superintendent's lack of engineering information, sometimes carelessness on the part of the men that can be detected, sometimes in carelessness that has been deliberately concealed. Some actual cases along these lines where purchasing agents were helped might be interesting.

A piece of 2-inch diameter plow steel wire rope with a breaking strain of over 140 tons looks strong enough to handle any load of logs that could be picked up around a logging camp, but a 2000-foot span of this same rope suspended across a canyon will support only as much weight as its deflection allows it to. If hung with a big sag or deflection in the center, it will carry a load at its center equal to a large percentage of its breaking strain. On the other hand if pulled tight it may actually break of its own weight without additional load.

Recently a lumber company installed such a span or "sky line." A very short time after being put in service the line broke while supporting a light load. "Faulty rope" was the cry. A practical rope engineer from the factory arrived on the scene, investigated operating conditions, "ran a few lines" with a transit and was able to show that the deflection had been too small and that the rope must have broken from overstrain. The superintendent who had rigged up the operation was not easy to convince, however. Rope of another manufacturer was demanded over the purchasing agent's protest. The second rope was installed under the same conditions—and broke in less time than the first. The purchasing agent's first choice was vindicated, the original manufacturer's rope was again used and his engineer allowed to recommend the proper working deflection with resulting efficiency in operation.

In another case a purchasing agent, after a careful investigation, decided to buy a certain make of rope for a mine hoist—two lengths were shipped off of the same master reel. The lines were installed in vertical shafts and worked on the same type of head sheaves and drums and under practically identical conditions. Ten days after installing one rope stranded, the other continued to work perfectly. The purchasing agent being held responsible asked the manufacturer to investigate—everything in the way of equipment seemed perfect—apparently nothing unusual had happened while operating. Finally in going over the stranded rope inch by inch and wiping off all grease and dirt it was found that there were spots at frequent intervals where the outside wires were pitted almost through—one of these pitted spots was where the line had stranded. Further investigation then showed that part way down the shaft was a bad strata of acid water that dripped on the line. Evidently the operator in one shaft had kept his line thoroughly lubricated, and the other operator had let his line run dry at times and the acid water had done its damage. Superintendent and purchasing agent benefitted by this investigation.

In the oil country things happen. A drilling company purchased several lengths of 1-inch casing line. All gave fine service except one length which was taken off after three days and condemned as unsatisfactory. The driller said it had "gone bad," had spooled it up and refused to have anything more to do with it. The log of the well showed nothing unusual, no fishing jobs or hard pulling, the drum was in fine shape as were the sheaves and traveling block. On unwinding the rope and going over it carefully it seemed scarcely worn, until near the center, under considerable dirt and grease, was found a flat spot about a foot long. The rope was actually flat and the wires showed bad scraping. The driller was hard boiled and claimed it 'just happened," "poor rope," and the superintendent was inclined to back him up. Obviously something was being concealed. Later it developed from some remarks dropped by the crew that the driller in a moment of carelessness had failed to watch the traveling blocks and on the up trip it had caught on the finger board near the top of the rig, overturned and before it could be stopped the lines were fouled and one part badly jammed. Driller and superintendent knew these facts and their concealing them was most unjust and rendered the getting together of the manufacturer and the purchasing agent practically impossible.

The writer has watched with special interest the activity of his own company in meeting many of these new conditions in the West. The development for the oil companies of a casing line for rotary work specially suited for deep drilling with heavy strings of pipe—for logging companies, of main lines, back lines and chokers to keep up with more powerful and faster steam machines and electrical equipment.

Harvest of the Sea

DURING the first three months of 1927 commercial fishermen operating in the inland waters and off the coast of California in the Pacific Ocean caught and marketed 159,390,739 pounds of fish, according to the quarterly report compiled for publication in California Fish and Game for July by the Department of Commercial Fisheries of the State Fish and Game Commission.

The greatest volume of any one variety of fish caught was 147,840,632 pounds of sardines. Running next comes rock cod, which totaled 2,401,811 pounds, and next is sole, which totals 2,225,476 pounds.

Los Angeles County was the banner producer of fish during the period covered in the report with 92,646,635 pounds, and Monterey, where the catch was mostly sardines, rates second with 55,827,511 pounds. San Francisco County ranks third with 5,873,815 pounds. San Diego County gets fourth place with a total for the three months of 2,808,900 pounds.

During the period, 4,067,045 pounds of fish was brought into California for canning from Mexican waters, coming through San Pedro and San Diego.

In the shell fish division, abalone totalled 307,168 pounds during the three months, while 232,292 pounds of shrimps were turned in by the fishermen. The shrimps were taken in Marin, San Francisco, and San Mateo Counties and the abalones in Monterey, Santa Barbara, and Ventura Counties. Spiny lobsters totalled 99,408 pounds, while over a million pounds, 46,660 dozen crabs, were taken during the period which the report covers.

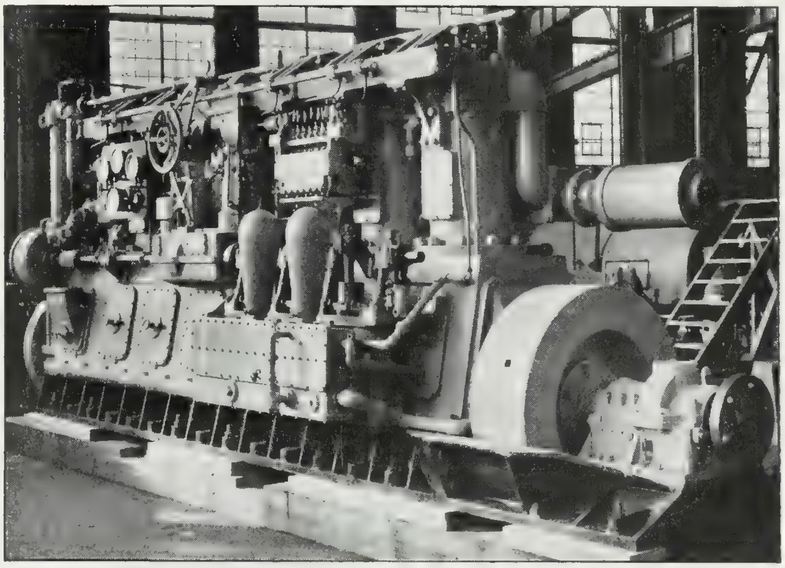
A part of the fishing fleet whose port is Los Angeles, California, and which was responsible for a large part of the sea harvest described above.

The Diesel Barge Tydol

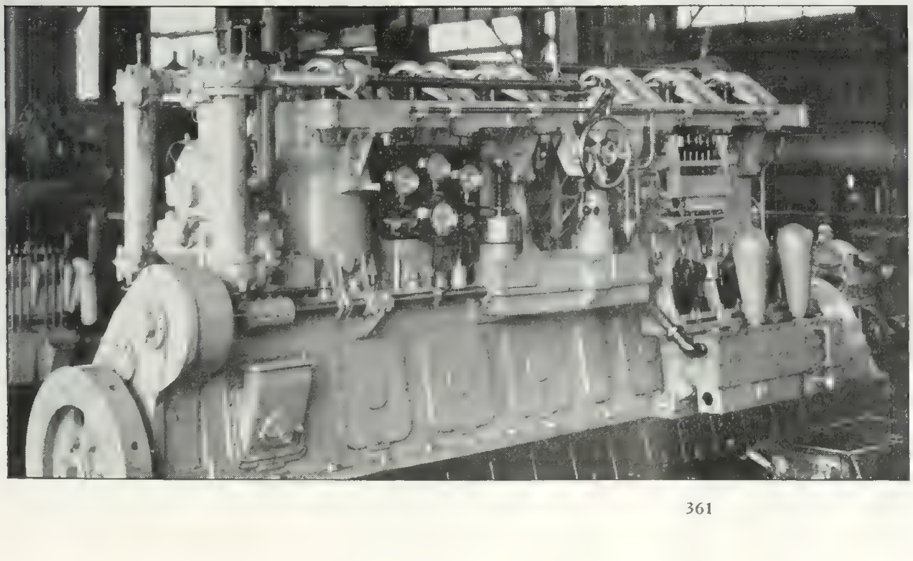
New Bulk Oil Carrier for Bay and Canal Service of the Tide Water Oil Company

THE Sun Shipbuilding & Drydock Company, Chester, Pennsylvania, has recently completed and delivered to the Tide Water Oil Company of New York a very interesting, specially designed bulk oil carrying barge equipped with diesel drive and fitted especially for the trade in gasoline and lubricating oils to points located on Long Island Sound and the Hudson River and the New York State Barge Canal, with possibly occasional deliveries as far north as Boston and as far south as Hampton Roads. This barge is named Tydol and her principal characteristics are:

Length on 12-ft water line	258′8″
Length between perpendiculars	252′0″
Length over-all	260′10¼″
Breadth molded	40′0″
Breadth over fenders	41′5″
Depth molded to deck at side amidships	14′0″
Depth from bottom of keel plate butt laps to highest point of permanent superstructure, approximately	24′6″
Shear at forward perpendicular	4′0″
Shear at after perpendicular	2′0″
Lowest point of shear at half length between perpendiculars.	
Designed draft (molded) even keel—sea water	12′0″
Designed canal transit draft from bottom of keel plate butt laps (even keel—fresh water)	9′0″



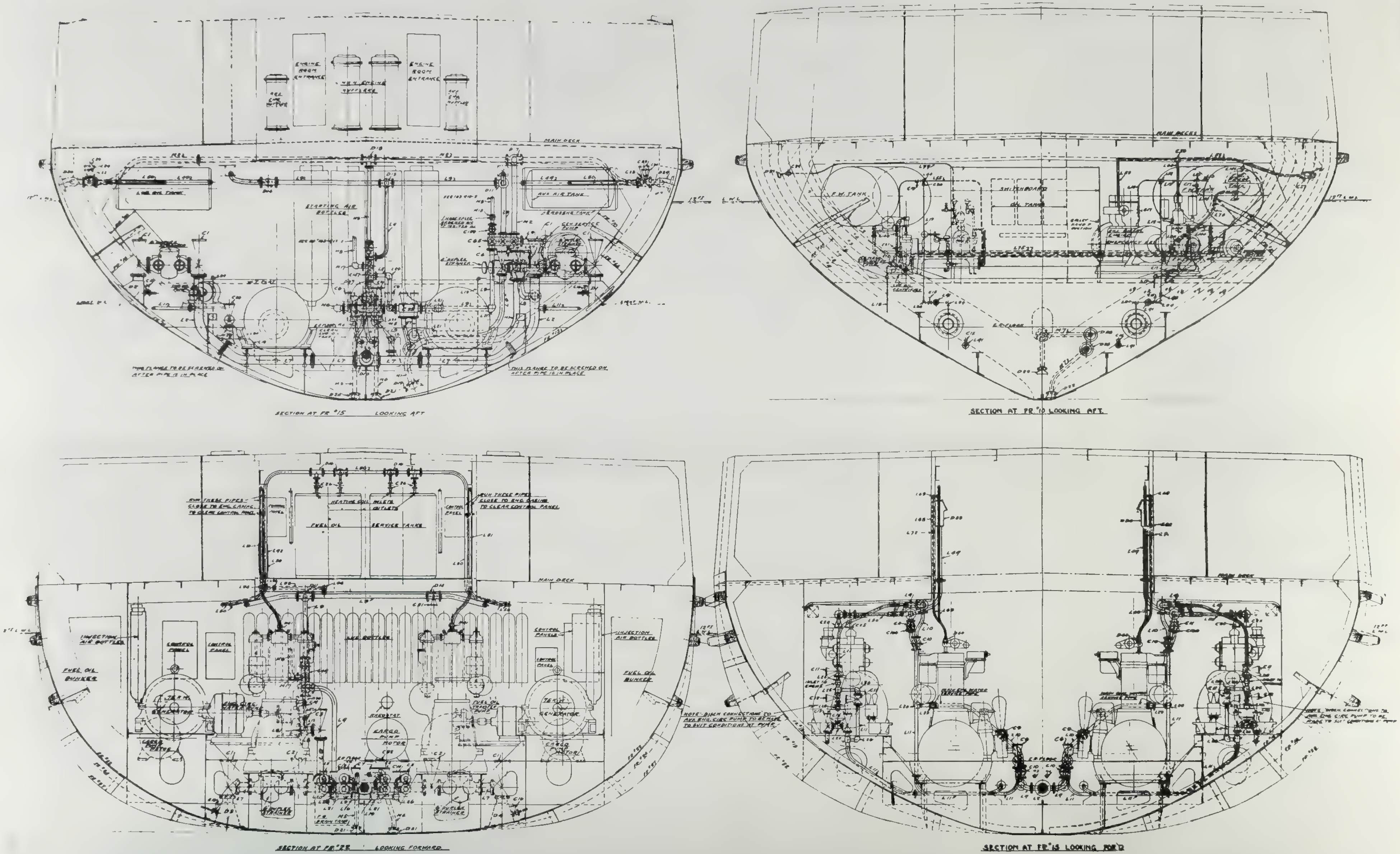
One of the 415 brake horsepower Winton, Model 121, 6-cylinder marine type diesel engines for the barge Tydol. Above, a stern quartering view of the operating side of the engine. Below, a view from the forward quarter.



The Tydol's displacement at 12-foot draft is 2778 tons. She has a block coefficient for displacement and length between perpendiculars of 0.7945.

The hull is divided into thirteen compartments. From forward to aft, these consist of the forepeak, a compartment devoted to lubricat-

Transverse Sections of the Tydol Showing the Machinery Arrangement



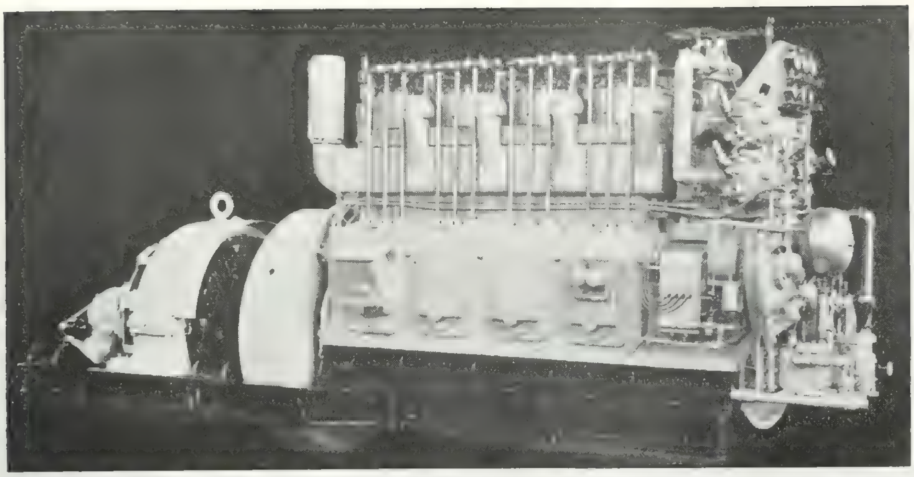
SECTION AT FR °15 LOOKING AFT

SECTION AT FR °10 LOOKING AFT.

SECTION AT FR °22 LOOKING FORWARD

SECTION AT FR °15 LOOKING FOR'D

These illustrations, taken from the working general arrangement of the Tydol, show the completeness of the diesel propulsion equipment installation on this modern canal barge. Note the battery of Lux bottles for fire protection on the forward bulkhead of the engine room and the very complete system of air bottles for starting and for auxiliary air.



The 75-kilowatt Winton-Westinghouse auxiliary power set, of which two are installed on the Tydol.

ing oil tanks, cargo oil tank No. 1, cargo oil tank No. 2, coffer dam No. 1, cargo oil tank No. 3, cargo oil tank No. 4, coffer dam No. 2, cargo oil tank No. 5, cargo oil tank No. 6, pump room, engine room, and after peak. It will be noted from this arrangement of compartments that the cargo oil tanks are arranged in pairs with a coffer dam between each pair of tanks. The lubricating oil tanks are five in number. They are entirely separate from the structure of the hull so that the compartment in which they are located acts as a large coffer dam forward of cargo oil tank No. 1, while the pump room acts as a coffer dam between cargo oil tank No. 6 and the engine room. The aggregate capacity of the lubricating oil tanks approximates 25,000 gallons, and the capacity of the cargo oil tanks is 14,000 50-gallon barrels.

The piping to the three pairs of cargo oil tanks is so arranged that three different grades of cargo may be carried in them and separately pumped without possibility of contamination. The lubricating oil tanks are arranged for separate pumping, having their own pump room with entirely separate installation of machinery.

In the superstructure above the engine room are comfortable quarters for the fifteen persons comprising the crew, which consists of a captain, two mates, one cook, four seamen, one chief engineer, two assistant engineers, three oilers, and one pump man. These quarters are provided with all modern conveniences including hot and cold running water, shower baths, and liberal provision of electric lights. The galley is electrically equipped with Edison apparatus.

It will be noted from the illustrations published herewith that the barge has no funnel, having been designed especially in this way for canal passage under low bridges.

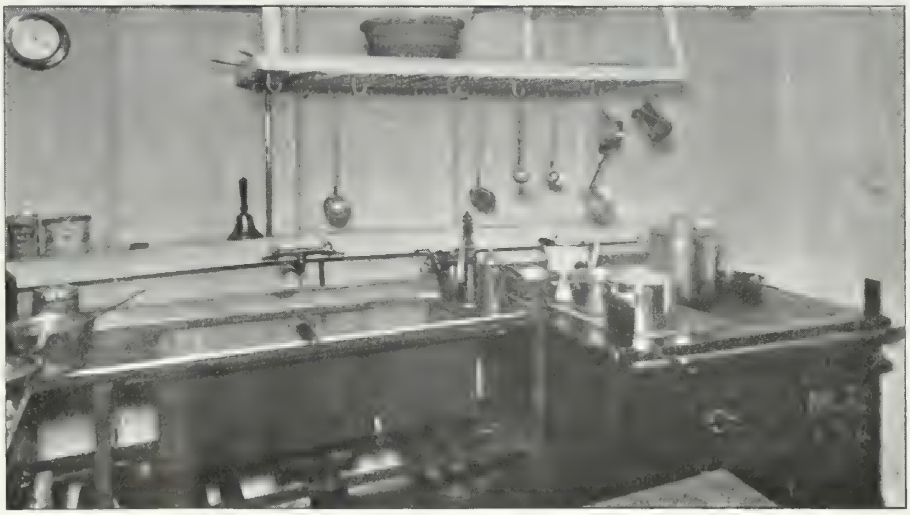
The main propelling power plant consists of two Winton Model 121, full diesel, single - acting, four cycle, air - injection, trunk piston, overhead valve, directly reversible, marine type engines, each of which has six cylinders with a bore of 14 inches and a stroke of 18 inches, and each of which delivers 415 brake horsepower at 247 revolutions per minute, although its normal rating is 400 horsepower at 250 revolutions per minute. Each of these engines is directly connected to a propeller shaft, and the twin screws so propelled drive the ship at 10 knots when loaded to the 12-foot water line. These engines, as will be noted from the illustrations, have attached air compressor, circulating water pumps, lubricating oil pump, fuel oil injection pump, and fuel oil service pump. The propellers driven by these engines are three-bladed, solid manganese bronze, of 6 feet 6 inches diameter and with a developed area of 14 square feet and an effective pitch of 5 feet.

For auxiliary electric power, two 75-kilowatt, 270-volt, direct current Westinghouse generators are installed, each direct-connected to a Winton Model 4-116 full diesel, single-acting, 4-cycle, nonreversible, marine type engine. These generating sets provide current for all of the machinery in the vessel aside from that directly attached to the Winton diesel engines.

The pumps in the engine room are all of the Northern Fire Apparatus Co.'s rotary type and consist of one reserve circulating water pump with a capacity of 250 gallons per minute, one fire, sanitary, and general service pump of 250 gallons per minute capacity, one bilge pump of 75 gallons per minute capacity, one fuel oil transfer pump of 75 gallons per minute capacity, all against 100 pounds pressure, and one lubricating oil pump of 125 gallons per minute capacity against 30 pounds pressure.

A lubricating oil centrifuge, electrically driven, of the Sharples No. 4 type, insures clean, efficient lubrication for all of the machinery.

For the comfort of the crew there has been installed a Brunswick-Kroeschell ½-ton, direct-expansion ammonia type refrigerating unit, with an independent rotary condenser and circulating pumps for drinking water. An Ilg 1500 cubic feet per minute motor actuated blower located in the machinery space distributes outside cool air to the machinery spaces and to the crew's quarters above by means of air ducts. An Ilg 16-inch exhaust fan pulls the foul air from the after end of the machinery room.



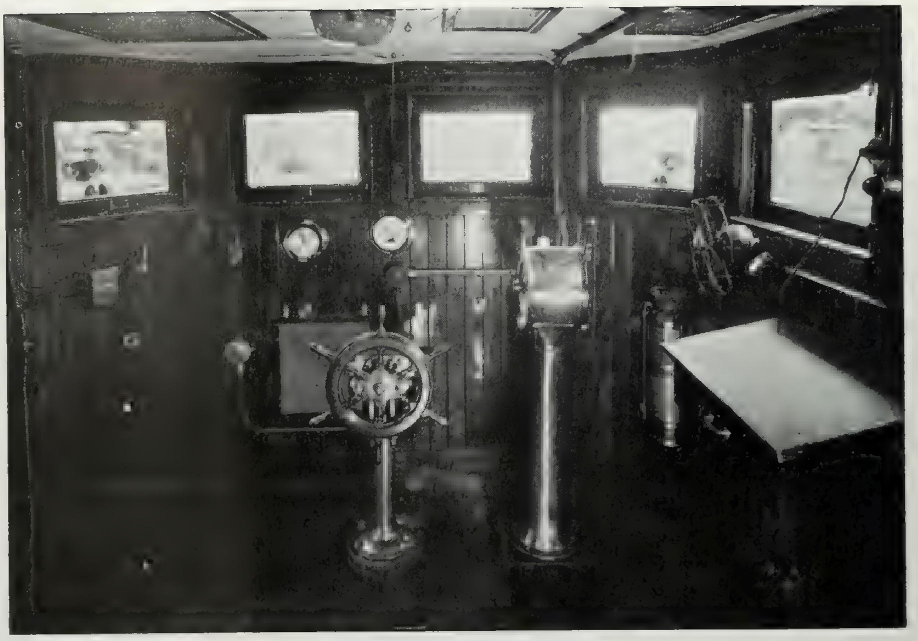
Electrically equipped galley on the Tydol.

A complete system of Lux carbon dioxide fire extinguishing units was installed by Walter Kidde & Co. of New York.

Three cargo pumps are installed in the pump room. These are all of the Northern rotary type and each is capable of handling 525 gallons of gasoline per minute against a discharge pressure of 100 pounds per square inch at a rotor speed of 300 revolutions per minute. These pumps are each driven by a Westinghouse 50 shaft horsepower, 900 to 1200 revolutions per minute, 220 volt, direct current motor, which is connected to its pump by shafting extending through the divisional bulkhead from the machinery space into the pump room.

The lubricating oil pumps are two in number and are also of the Northern rotary type. Each of these pumps is capable of handling 150 gallons per minute against a discharge pressure of 100 pounds per square inch and at a pump rotor speed of 850 revolutions per minute. Each pump is direct-connected to a Westinghouse 15 shaft horsepower, 650 to 800 revolutions a minute, 220-volt, direct-current motor. These motors are each entirely enclosed in vapor-proof casing, which is vented to and from the deck above.

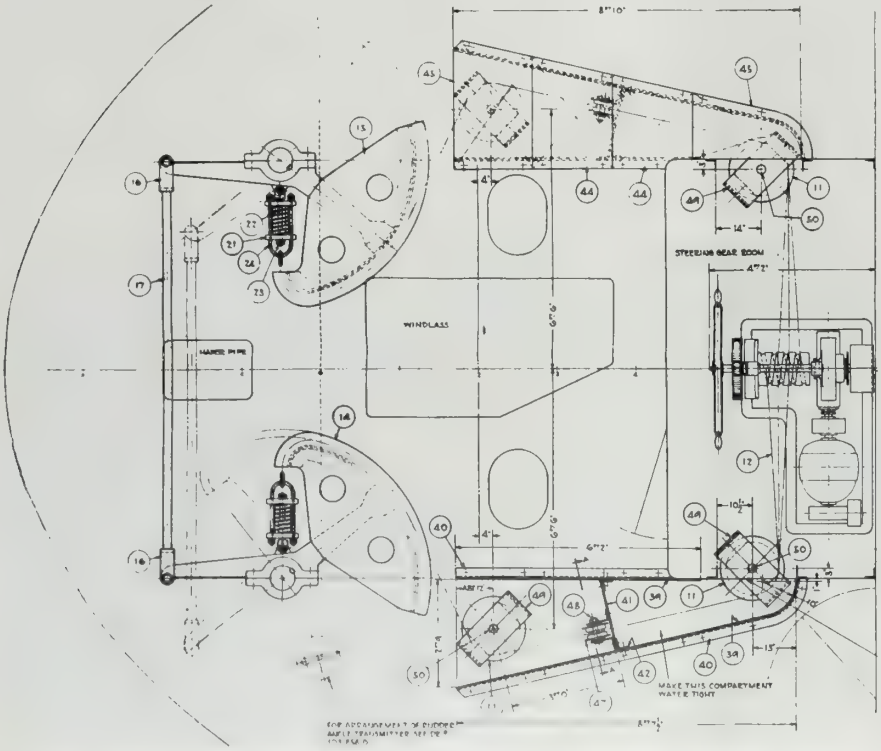
In the navigation of the Hudson River and the barge canal, a great deal of maneuvering will be necessary, and the Tydol has been equipped with twin balanced rudders, by which she is steered with great facility at practically all drafts. These rudders are controlled by an electric steering gear of the Allan Cunningham geared drum type, driven by a 10-horsepower motor and controlled by Allan Cunningham telemotor from the amidship wheelhouse and from the harbor wheelhouse. For emergency purposes mechanical hand control is provided at the unit itself.



Pilot house on the Tydol featuring the Allan Cunningham electric steering gear.

The Tydol is provided with two stockless bower anchors of 1500 pounds each and one stern mushroom anchor of 500 pounds. These are provided with suitable lengths of 1⅛-inch stud link chains and are handled by Allan Cunningham type O.W. A. triple spur geared windlasses, each driven by a 10 shaft horsepower motor. The forward windlass has two wildcats and two gypsy heads and the after windlass one wildcat and one gypsy head.

The Tydol is giving a very good account of herself and her machinery is functioning 100 per cent to the satisfaction of her builders and her owners.



Plan of tiller and electric steering gear of the Tydol as furnished by Allan Cunningham of Seattle.

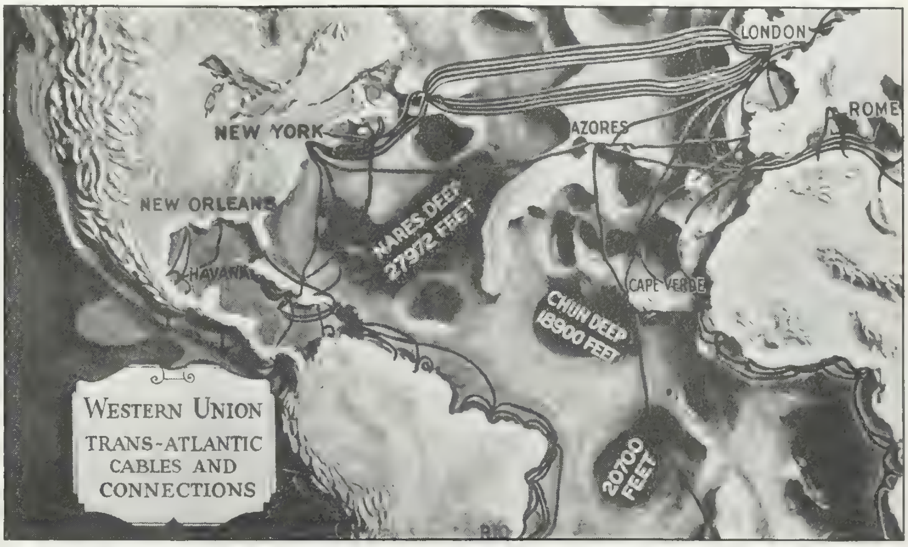
An Interesting Burner Development

COINCIDENT with the announcement that the United States Shipping Board had approved a plan to install apparatus in the steamer Mercer for burning pulverized coal, the Research Engineering Corporation of 25 Beaver Street announced today the successful development of a burner for marine and general use that consumes powdered coal, oil or gas either separately or in combination.

The new device, which has undergone a year's test, is the invention of D. J. Irish, a well-known combustion engineer who is connected with the Combustion Service Corporation, a subsidiary of the Research Engineering Corporation. He was formerly combustion engineer for Babcock & Wilcox, and is a graduate engineer of Cambridge University.

Cables Bring Knowledge of Ocean Depths

SINCE the first savage sank his paddle into the current to see if his crude bark was in danger of grounding, men who go down to the sea in ships have been interested in knowing the depth of the element upon which they floated. The Phoenicians, those intrepid sailors of ancient times, knew the use of the lead or plummet, and Magellan circumnavigating the globe, tried to measure the depth of the Pacific—the earliest recorded attempt at scientific oceanography.



Relief map showing relation of cables to Atlantic Ocean Deeps

Millions of soundings have been made by sailormen throughout the seven seas since Magellan's unsuccessful effort, but it is only with the era of deep sea cables that anything like a comprehensive picture of the topography of the ocean floor has been obtained.

Charts begun in 1886 by Sir John Murray show in excess of 6,000 deep sea soundings, but include only those of depths greater than 1,000 fathoms, or 6,000 feet. Of these about 2,500 were taken in the Atlantic and about the same number in the Pacific, while over 1,000 were in the Indian Ocean.

These soundings give at least a general picture of the ocean bottom, and indicate beyond doubt that far from being the level plain one might imagine, it is as seamed and broken as the continents, with vertible mountain ranges, wide plateaus and tremendous valleys.

The deepest sounding ever made is that of 34,210 feet recently reported by the German Navy Department as having been made near the Philippine Islands by the German cruiser Emden. This is a depth of nearly six and a half miles, or nearly a mile greater than the height of Mt. Everest, tallest peak in the world. This means that the known range of variation in the level of the earth's crust, from the greatest height above sea level to the greatest depth below, is 63,351 feet, or approximately 12 miles.

Areas of the ocean floor covered by more than 3,000 fathoms of water are known as "deeps," and have been given names usually derived from that of the scientist, ship or expediton discovering them. These "deeps" number 57, of which 32 are in the Pacific, 19 in the Atlantic, 5 in the Indian Ocean, and one partly in the Atlantic and partly in the Indian Ocean. From the point of view of depth, the Challenger Deep in the North Pacific and the Aldrich Deep in the South Pacific are the most important, being the only two with depths exceeding 5,000 fathoms.

The Nares Deep is the largest lying wholly in the Atlantic, covering an area near the West Indies of some 697,000 square miles, and having a maximum depth of 4,662 fathoms, or 27,972 feet.

Three-fourths of the Atlantic sea floor is covered by water exceeding 1,000 fathoms in depth, and over one-half by water exceeding 2,000 fathoms, but the most characteristic feature compared with the Pacific and Indian Oceans is the large proportion covered by water less than 1,000 fathoms in depth. The most striking feature of the Atlantic is the low central ridge, dividing the ocean into eastern and western basins. Another feature is the gentle slope off the American coasts and off the British Isles, as compared with the slopes off Africa and off Spain and Portugal.

One of the most significant features of the North Atlantic unquestionably is the famous "Telegraph Plateau" some 400 miles in breadth, which with its oozy bottom forms a veritable cushion for the network of telegraph cables which crosses it today. It was of this plateau that Lieut. M. F. Maury, U. S. N., pioneer oceanographer and maker of the first bathymetrical map of the Atlantic, spoke as "apparently placed there for the express purpose of holding the wires of a submarine telegraph and keeping them out of harm's way."

Americans have been pioneers in modern hydrographical and oceanographical research. The work of the United States Navy and United States Coast Survey dates back to 1844. In addition to the pathfinding work of Lieutenant Maury, Lieut. O. H. Berryman sounded across the Atlantic from Newfoundland to Ireland in making a survey for the first Atlantic cable; Midshipman Brooke invented a sounding device which greatly facilitated the work and opened the way to study of ocean bottom deposits; and a long line of distinguished naturalists, among whom Louis Agassiz and Alexander Agassiz were outstanding, followed with important contributions. Throughout the same period, British scientists were carrying on a marvelous work, pre-eminent among their expeditions being that of the Challenger, which was undertaken simultaneously with the important cruise of the U. S. S. Tuscarora.

Before laying a submarine cable, a route must be surveyed with almost the same minute exactitude observed in laying out a railway line. Just as the roadway of steel must seek the path freest from mountain chains, precipices and gorges, so must the cable pick its

(Continued on Page 33, Advertising Section.)

PIER B-C

at

Vancouver

Finest Terminal on Pacific Coast

THE CANADIAN PACIFIC RAILWAY CO. DEDICATES HUGE PASSENGER & FREIGHT TERMINAL TO ACCOMMODATE ITS RAPIDLY EXPANDING ORIENTAL AND COASTWISE BUSINESS.

DOMINION PHOTO CO. VANCOUVER B.C.

PACIFIC AIRWAYS VANCOUVER B.C.

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R.M.S. EMPRESS of ASIA DOCKING AT PIER B-C

DOMINION PHOTO CO VANCOUVER B.C.

On July 4, 1927, with very interesting and impressive ceremony, the City of Vancouver, British Columbia, formally dedicated the huge new Canadian Pacific Railway pier known as Pier B-C. This terminal, which cost over six million dollars and was ten years in the building, is one of the finest and largest piers for ocean liners in the world. It has a total length of 1100 feet and a total width of 315 feet. There are 225,000 square feet of floor area available for freight handling purposes and eight railway tracks capable of accommodating 200 cars at once. It was at first intended to build two separate piers, Pier B and Pier C, but these piers were combined in the final plan, hence the designation B-C.

As shown in the illustrations, the pier is crowned with two single deck freight sheds. Each of these sheds is 109 feet wide. Between them are large freight handling platforms and a central depressed track area containing four tracks.

Several facts concerning the construction of this pier are of interest to dock engineers. It is the first pier on the Pacific Coast of Canada to be built with concrete piles. These piles were poured and cured and driven on the job.

The sea bottom at the pier location showed hardpan or sandstone shale 60 feet below high water at the shore end and 200 feet below high water at the outer end. Above this hardpan was a layer of firm white clay ranging in thickness from 35 feet at the shore end to 100 feet at the outer end. Above this firm clay at the outer end there was about 40 feet of silt, principally sand, clay, and mud. The preliminary preparation for foundations consisted in removing practically all of this silt from the site of the pier. This was done by dredging some 260,000 cubic yards from the bottom, leaving a huge trench, which was finished toward the end of 1919. During the next two years this trench was filled in nearly to low water level with 843,000 cubic yards of gravel. This was allowed to settle for six months and another 530,000 cubic yards were added to it. Into this gravel bed and its clay bottom were driven 6000 concrete piles. And on these piles was built the floor of the pier and its freight sheds.

The pier is equipped with a battery of ten elevators for handling freight and baggage and with two powerful traveling gantry cranes for handling the heavier items. In addition to these, there is a 20-ton team elevator installed on the viaduct between the new pier and Pier D.

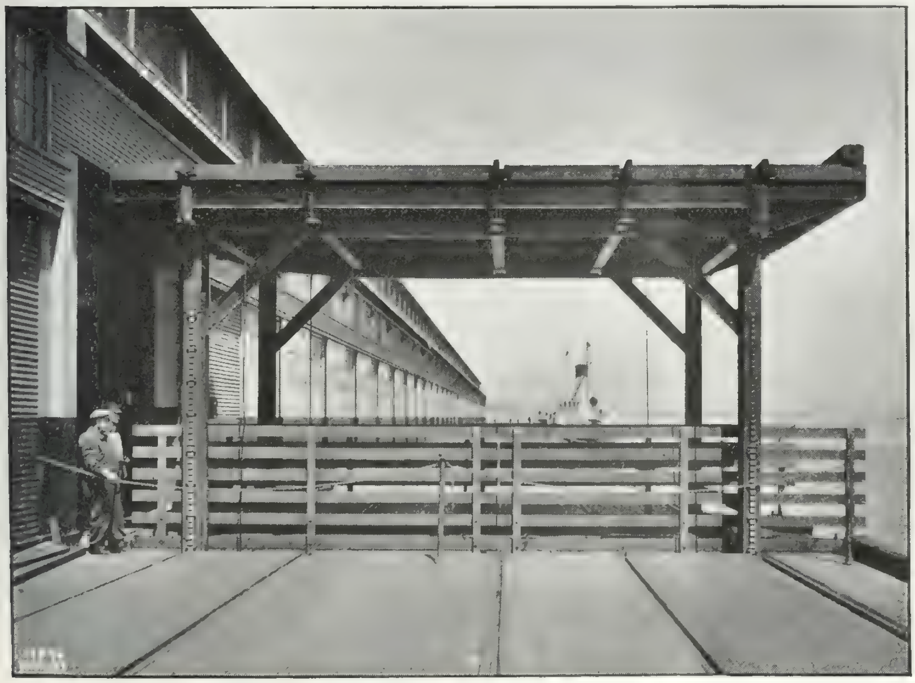
Eight of the elevators are of the well known Pacific Coast Barlow type, one of which is shown in the illustration accompanying this article. These elevators are so arranged that the deck of the pier above them consists of a steel bridge carrying on upper side sections of the two outer railroad tracks and the crane rail. Mechanical arrangements are provided for hoisting these sections of the pier deck vertical a distance of 15 feet and so clearing the space below for the operation of the elevator. The Barlow elevators are designed with the idea of facilitating the discharge and loading of freight directly from the ship to pier, irrespective of the tidal level. They are so designed that an apron projects outward from the elevator into the side port of the vessel so that freight can be moved out directly on the pier level. These elevators were installed by the Colby Crane and Engineering Company.

Another very attractive feature of the new pier is the brilliant illumination. The upper story of the shore end is flood lighted by a battery of high powered lights installed by the Northern Electric Company of Vancouver. This shore end is in the Spanish Mission style of design in the light cream colored stucco and lends itself admirably to this method of illumination. The interior of the freight sheds is illuminated by four rows of 300-watt lamps at 20-foot centers the entire length of the shed, with panel switchboards controlling the lights in pairs. Intense illumination for cargo working purposes is thus provided at any section of either shed.

Another interesting feature is the double fender system. This consists of a line of stout floating fender logs from three to four feet in diameter which are securely fastened all along the outside of the pier and which form the first line of defense against shock from vessels. The second line of defense consists of a row of creosoted piles spaced about five feet apart and securely bolted to a fender beam entirely surrounding the two sides and the end of the pier. This fender beam consists of laminations of planks and averages a foot in thickness. Between this fender and the pier proper are massive double coil compression springs spaced on 10-foot centers. Each of these springs is designed to compress approximately 4 inches under a pressure of 30,000 pounds.

A new 100-pair main telephone cable has been installed between the Canadian Pacific Railway depot and the new pier, with distribution branches to all offices and to various positions in the sheds and to the pier edge for ship connections. A fire alarm and night watchman system and the tower clock are all electrically controlled.

This pier was designed and constructed by Sydney E. Junkins Co., Ltd., of British Columbia.



One of the eight Barlow elevators installed on Pier B-C.

De La Vergne Oil Engines

THE De La Vergne Machine Company, oldest oil engine manufacturer in America, has recently entered the marine field, offering its line of vertical solid injection diesels of the nonreversing type in sizes from 130 horsepower to 1500 horsepower. This company started building heavy duty oil engines in 1892, six years prior to Dr. Diesel's invention, having taken over the American manufacturing rights of the Hornsby-Akroyd engine. The following year they purchased the complete drawings and started manufacture of the De La Vergne Type "HA".

Many changes and improvements have taken place since that time, the most noteworthy being their development of the solid injection diesel in 1917. This system was at first applied to one of their Type FH engines and installed in the power plant of the Earle Light and Water Company, Earle, Arkansas.

It was not until 1921 that De La Vergne started building vertical engines, although prior to the war an extensive study was made of this type and a few units built.

Since the start of this line the company has brought out three models as follows.

	Cylinders					
Model VG	2	3	4	5	6	8
Model VA		3	4	5	6	8
Model VB			4	5	6	8

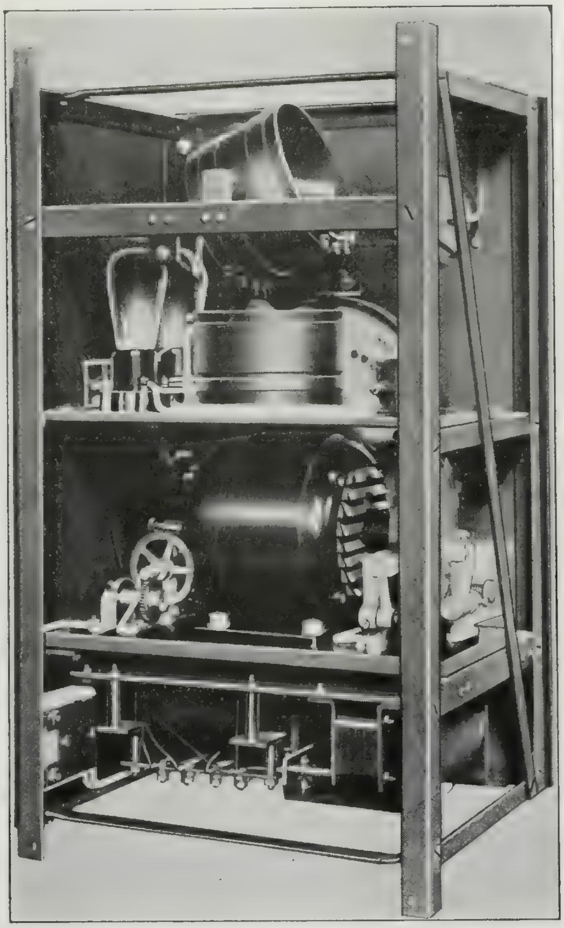
The Model VG is of 65 horsepower per cylinder and runs normally at 277 revolutions per minute. The Model VA is 100 horsepower per cylinder at 225 revolutions per minute, and the Model VB is 187 horsepower per cylinder at 180 R.P.M.

This company's business has continued increasing from year to year until for the year 1926 they report an increase in business substantially 30 per cent greater than their former biggest year. Because of this they have not pushed their marine business to any great extent. So far they have made all of their marine installations on the Atlantic Coast but have recently started actively after Pacific Coast business. Being connected with the Pelton Water Wheel Company, they have their office at Nineteenth and Alabama Streets, San Francisco. They have some recent catalogs describing their engines which are very interesting.

Mobile Radio Beacon and New Type Radio Compass

An ocean liner is plowing its way along the steamship lane, nearing New York harbor. As darkness falls, a heavy fog blows over from the west, enveloping the ship and blotting out the lights of other vessels on the horizon. The view from the bridge extends only a few feet beyond the ship's prow.

The officer on watch reaches up to a small black box fastened on the pilot house wall and snaps on a switch. Immediately every radio-equipped craft within ten miles hears a series of one-second dashes for a half-minute, on a wave of 850 meters, followed by a half-minute of silence. The radio compasses on those ships, tuned to 850 meters to receive any possible beacon signals, tell the officers on watch when a signal is being received by flashing a light off and on as they hear the dashes. Using its radio compass, each ship takes bearings on the first vessel and any others within range, and is warned of approaching danger.



Rear view of the Kolster mobile type radio beacon for use on shipboard.

Front view of the mobile type radio beacon.

The officer, after turning on the beacon, keeps his eye on the visual indicator of his own radio compass, ready to take bearings on other ships during the half-minute his radio beacon is silent. A series of flashes calls him over to the radio compass, in a few seconds he has found the position of an unseen vessel in the danger zone, and he gives orders to shape the liner's course accordingly.

After taking radio bearings all night and warning other craft of her approach, the great ship safely enters the harbor early in the morning, guided into her berth at quarantine by the unerring radio flashes from vessels and shore beacon stations hidden behind the curtain of fog.

Dr. F. A. Kolster, the inventor of the radio compass bearing his name, has perfected a new radio beacon to be carried on ships which automatically broadcasts a warning signal over a ten-mile radius to other ships in its path. About the size of a small radio set in the home, it is installed in the pilot house, independent of the ship's wireless. In foggy weather it is turned on and transmits a characteristic radio signal. Other craft hear the warning and locate the on-coming vessel through the use of the radio compass, which tells the exact direction of the signals.

Shipping officials who have examined and tested the new beacon are warm in their praise of this additional safeguard to lives and property at sea in a fog. They characterize present methods of warning, limited to the sound of a whistle or a bell, as primitive. Passengers are hoping that before long they will be able to sleep instead of listening to a fog horn all night, and at the same time know that they are better safeguarded than before.

The Kolster mobile beacon serves exactly the same purpose as a lighthouse beacon on land. Instead of pointing out the location of a lighthouse, however, it indicates the position of the ship on which it is installed. Simplicity and inexpensiveness were two points Dr. Kolster bore in mind while designing this radio beacon for ships, so that it would be easy for all navigators to equip their vessels with it and increase safety on the seas. The entire apparatus is a single piece of equipment, housed in a cabinet 24 inches high, 15 inches wide, and 12 inches deep, and intended for wall or table mounting.

It is a small, low-powered, single-tube transmitter, using interrupted continuous wave and operated directly from the ship's mains, which may vary from 80 to 120 volts of direct current without affecting the operation of the beacon. The result is simplicity of operation for the navigator, as no additional power machinery is required.

Direct current supplied to the transmitter is converted into approximately 750-cycle alternating current by means of a converter transformer and interrupter. The primary winding of the converter transformer consists of two separate windings so connected through the interrupter that current flows through each winding alternately and in such a direction as to induce an alternating current in the secondary.

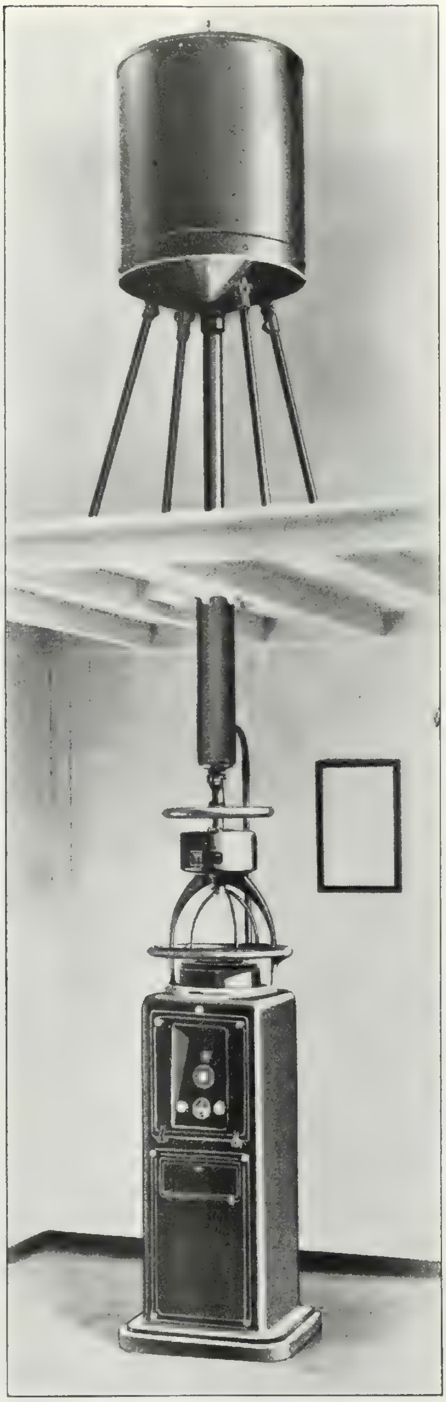
A closed core transformer is used to transform this alternating voltage to the proper voltages for the plate and filament supply of the transmitting tubes. The radio frequency circuits of the beacon transmitter consists of an antenna circuit inductively coupled to a local oscillatory circuit in the plate supply of the tubes.

Power output is controlled by a rheostat connected in series with the power supply and the converter transformer. It can also be controlled by the coupling between the antenna and local circuits. When the transmitter is in operation, the radiated power should be just sufficient to enable a signal to be picked up at a distance of about ten miles. In most cases, from 0.2 to 0.3 amperes will be sufficient, in order to reduce to a minimum any interference which may be caused by the mobile beacon. The total load taken from the ship's generators is only about 3 amperes, and the power consumption is about 300 watts.

The antenna for this transmitter is a single wire about 50 feet long. A switch is provided for disconnecting the antenna and the ship's radio aerial when it is necessary to take radio compass bearings on board a vessel equipped with both beacon and compass, as a closed antenna, either on the beacon or the ship's radio transmitter, might deflect the incoming signals sufficiently to cause an incorrect reading.

To set the beacon in operation, the navigator turns a switch on the bottom of the panel. Turning it to position marked "1" connects the interrupter motor to the ship's supply and starts the automatic signaling device. As soon as the motor attains full speed, the switch is turned to the next position, which places the transmitter in operation. Ammeters at the top of the panel indicate the amount of antenna current and filament supply to the tubes. The filament current should not exceed 2.5 amperes. Turning the switch to the third or "Off" position disconnects the power supply and stops the transmitter.

A small power tube is used, supplied with alternating current by the converter. The automatic signal ing device is a wheel with the characteristic signal cut into its edge in the form of teeth. As the teeth pass the key, it is pressed down and up, forming and breaking the contact. Half of the wheel is cut for signals, and the other half is blank for silence. It turns at the rate of one revolution per minute.


New type Kolster radio compass as installed on board ship

The wavelength adjustment and the coupling between the antenna and local circuits when once fixed are clamped into position so that there will be no chance of the equipment becoming detuned and causing interference on other wavelengths. Its wave of 850 meters has been assigned to it by the Federal Radio Commission. All S. O. S. calls are sent out on 600 meters, the mobile beacon has been given 850 meters, and shore beacon stations broadcast on 1000 meters.

From 600 to 1000 meters is the reception range of the radio compass invented by Dr. Kolster, which made its appearance recently in a new form, for installation on two ocean vessels and two car ferries on the Great Lakes. One of the new departures is a visual bearing indicator, a colored light that flashes the characteristic signal being received and glows with a brilliancy in proportion to the strength of the signal. Now the navigator is able to set the loop aerial dead ahead on his course and it will automatically warn him by its glow when he comes within the danger zone. The navigator does not have to keep the ear phones on and stand at the compass, as before, but can move about the bridge, occasionally glancing at the lamp. When it signals, he can take a compass bearing. Ear phones are also still used for faint signals.

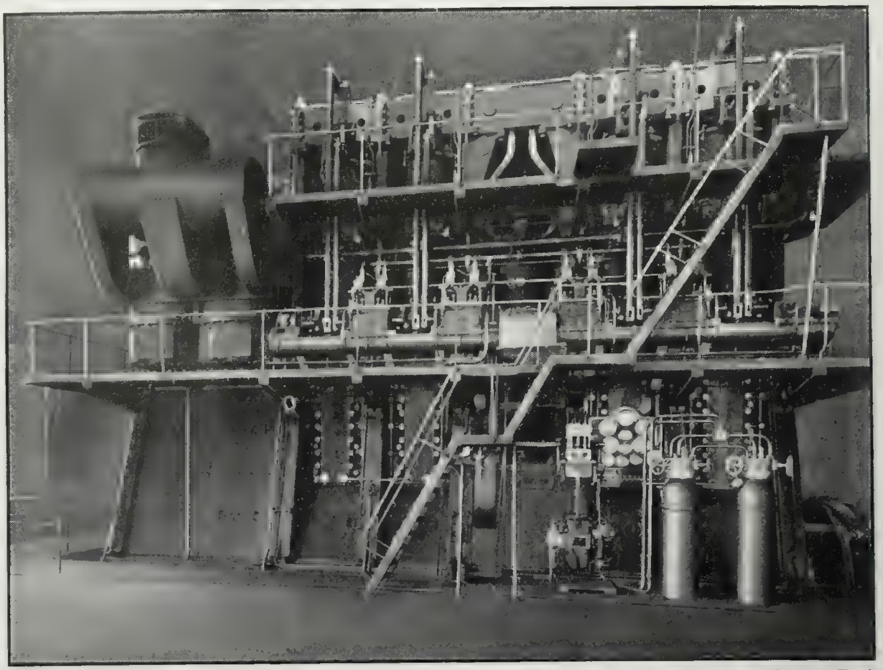
The radio waves are received on a directional coil which has been improved by Dr. Kolster. Instead of a large square frame, it is now an enclosed coil of small dimensions, protected by bakelite against the elements and shielded against wind pressure when being turned from within the pilot house. The compass is used a great deal in severe storms, and turning the coil without fighting the wind, ice and spray is a relief to the navigator. In addition, it rotates on ball bearings. The accuracy of the instrument is guaranteed to be within one degree over 50 miles and within two degrees over 100 miles, but actual tests have shown one-degree accuracy over several hundred miles. A uni-directional system can be used to indicate whether the signals are coming from ahead or astern.

The cast aluminum binnacle of the modern radio compass is about three feet high and contains a new type of 8-tube highly selective receiver which cannot oscillate. It has an illuminated one-dial tuning control on a sloping panel, with the volume control, uni - directional switch and on-and-off switch handy. A compartment in the base houses the batteries and a special locker protects the ear phones.

(Continued on Page 33, Advertising Section.)

Nelseco Double Acting Diesel

3680 Brake Horsepower 2-Cycle, Double Acting Engine for United States Shipping Board Finishes 30-Day Test With No Stops



The 2-cycle, double acting M.A.N. type marine diesel engine, built by the New London Ship & Engine Company for the United States Shipping Board, 3680 shaft horsepower from four cylinders at 115 revolutions a minute.

WITH the advent of the double-acting diesel engine in marine circles a new and progressive step has taken place in the application of the internal combustion engine for seagoing ships of all types and sizes. Shipowners who are at all conversant with the great and increasing success of motorships have doubtless realized that sooner or later they would utilize the diesel engine in their fleets. Some have possibly been deterred from taking this action by the initial investment required, others through lack of information on the subject, and still others by the belief that the large slow speed diesels were passing through an evolutionary stage in type and design. This latter thought has proved correct, but progress has been relatively slow, covering, as it has, a period of over a dozen years.

It is well known in shipping circles that the single-acting diesel engine has operated on the high seas for many years with great satisfaction to its owners. These engines have thoroughly proved the reliable operation of motorships and have effected large annual savings. Competitive conditions, however, demanded ships of greater earning power which in turn means more deadweight tonnage and cubic capacity, when considering hulls of similar characteristics. The attainment of additional carrying capacity necessitated a reduction in the engine room length, as well as in the total weight of the propulsive machinery. These advantages could only be obtained, to the highest degree, by the introduction and application of the double-acting principle.

The engine illustrated was built by the New London Ship and Engine Company at Groton, Connecticut, and represents the latest development of the 2-cycle, double-acting diesel engine in this country. It develops 3680 shaft horsepower at 115 revolutions per minute, and is of the 4-cylinder, air injection type with scavenging pump attached. Combustion takes place above and below the piston in each cylinder during every revolution, resulting in the smoothest possible flow of power through the crank shaft. One can readily appreciate that the 2-cycle, double-acting type represents the final development of the internal combustion engine as it is obviously impossible to obtain a greater number of combustions from one cylinder during a revolution.

The engine has just completed a 30-day non-stop full load test carried on under the supervision of representatives from the United States Shipping Board, to whom the engine will be delivered. During this run, the engine developed a continuous output of 3680 brake horsepower when operated at a speed of 115 revolutions per minute. The length of the test was selected in order to compare with the longest sea run which Shipping Board vessels are called upon to make. It is interesting to note that this run, carried out without any stops whatsoever, constitutes the longest test to which an engine of this size has ever been subjected in this country. This display of reliability and continuous power output has amply demonstrated the excellence of design, workmanship, and material employed by its builders.

This 3680 shaft horsepower Nelseco 2-cycle, double-acting engine, type D4Z70/120, will be installed in the steamer Willscox. This ship is of 9500 tons, deadweight, 420 feet in length, 54 feet width, 33 feet 9 inches depth, and was originally fitted with a 2800 indicated horsepower steam engine. She is of the Oscar Daniels type and was originally built at Tampa, Florida. The additional horsepower will result in considerably more speed than the ship developed formerly.

A brief review of the original design and development of the first large double-acting diesel engines will, we believe, be of interest, inasmuch as it illustrates the long and painstaking efforts devoted to the attainment of this advanced type of prime mover.

Early in 1911 the Maschinenfabrik Augsburg Nurnberg, A. G., of Augsburg, Germany, who were the pioneers in the development of the diesel engine and are the licensors of the New London Ship and Engine Company, undertook the design and construction of a 6-cylinder, 2-cycle, double-acting engine to develop 12,000 shaft horsepower. This engine was to the account of the German Admiralty for use in a light cruiser. Due to the magnanimity of the order, M. A. N. first constructed a single experimental cylinder of 2000 horsepower, which was the basis for their design of the larger engine. After due tests and experimentation, the 12,000 horsepower engine, at that time the largest diesel engine in the world, was finally finished and successfully passed tests at the M. A. N. Nurnberg shops. The intervention of the World War delayed the development of similar units and it was not until 1920

(Continued on Page 26, Advertising Section.)

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Pacific Workboats and Their Power Plants

With the Boat and Engine Builders

The Union Gas Engine Company of Oakland shipped last month to San Pedro a 150-horsepower, 6-cylinder full diesel engine for Captain Dragovick's new fishing vessel which has been built by the Los Angeles Shipbuilding and Dry Dock Corporation. The new boat will probably be in commission soon, and will at once begin work on the fishing grounds off the Southern Coast.

The Union Gas Engine Company has in hand orders for several new units for industrial plants, and it is quite probable that an order for a large seagoing plant will soon be written by an owner who now operates others of this type. This company recently shipped a 60-horsepower gas engine to the Hudson Bay Company, Vancouver, which will be installed in the Fort MacPherson, at Point Barrow, north of the Arctic Circle. It replaces another Union engine which has been in service in the Arctic regions for fourteen years. It is claimed that this installation will be the farthest north that any engine has ever been installed.

The Atlas-Imperial Engine Company of Oakland has been fully employed lately turning out marine and industrial units of their new type of diesel which has been brought to a high state of efficiency. During the month just past there have been twenty-eight sets of these shipped. One of 200 horsepower, one of 48 horsepower, having four cylinders, and two generator sets of 175 horsepower each, being for marine plants foreign.

A newly designed 6-cylinder high speed diesel has just been completed at the shops for a yacht ordered by John Gilbert, the actor. These diesels are built to run continuously at 600 revolutions per minute and practically vibrationless at this rate, developing well over their rating of 75 horsepower.

A PIONEER SHIPBUILDER PASSES

Captain Henry Peter Anderson, known to his many friends as "Pop," and one of the oldest and most widely known shipbuilders on San Francisco Bay, laid down his tools forever the first part of July, dying suddenly at the age of 74. For many years he was the senior partner of the firm of Anderson & Cristofani, with yards near Hunter's Point. Here have been built many famous work and pleasure boats, among them Jack London's Snark. Captain Anderson was a native of Denmark, but became an American citizen many years ago. Walter Anderson, his son, will take the head of the business now that the captain has been relieved from further duty by the Master Builder.

Queer types of house boats at a San Francisco boatyard.

It has just been announced by the Atlas-Imperial Engine Company that the New York office of the Honolulu Iron Works, at 165 Broadway, will handle all the firm's North Atlantic business. The field covered will extend from Maine to Virginia, with suboffices and service stations at all principal ports.

K. H. Nilsson, former vice-president and treasurer of the Bolinder Company, will be the eastern manager of the new combination. Mr. Nillson, having made a specialty of internal combustion motors for years, is eminently qualified for the position he has now taken. To familiarize himself with the latest methods of manufacture and operation, Mr. Nillson has spent several weeks at the Oakland plant, and will also go south to San Diego and Los Angeles to study the operation of Atlas-Imperial diesels in Southern California installation.

The Standard Gas Engine Company of Oakland has recently shipped to Monterey, San Pedro, Seattle and Vancouver several of their 40-horsepower gas engines which are so well known among the fisher folks. There seems to be a steady demand for Standard gas engines, many boat operators preferring them to other types.

In addition to the manufacture of gas engines, the Standard shops have for several months past been building the Hamilton transmission for Fordson tractors. A short time ago an order was received from Lisbon, Portugal, for these transmissions, showing that Pacific Coast products are entering far fields.

Wm. Cryer & Son, Oakland boatbuilding company, has been quite busy the past few months, and beside the regular run of repairs has in hand the big seagoing cruiser for an Oakland capitalist. This vessel will be very strongly built and of good lines, and her 75-horsepower, fully reversible, Atlas-Imperial diesel will insure good speed. Having a full raised deck, this vessel can keep the sea in any weather, and will no doubt turn out to be a very able and comfortable boat. She will be a duplicate, with some improvements, of the cruiser Pasada Manana.

The sloop Edna has been bought by Wm. Cryer & Son and given a thorough overhauling at their yard on the Oakland Estuary. She is now like new and will be probably sold to southern parties. The sloop Bob, of the ark class, has also been rebuilt and will go into commission very soon.

Bundesen & Lauritzen of Pittsburg, California, are now placing the new Worthington diesels in the workboat Drake. At the same time the hull will be thoroughly overhauled, and when the Drake goes on her run again it is claimed she will be better than new. That there will be a great saving in operating expense is sure, as her former power plant of gas engines consumed fuel at a considerably more cost than the diesel engines will.

W. J. Stone & Son at Oakland have launched the first of two heavy workboats for the Crowley Launch & Tugboat Company. These vessels will be equipped with Pacific-Werkspoor diesel engines of 300 horsepower. All modern improvements in lighting and pumping will be a part of the design. Stone reports a good run of repair work and also some prospects for new jobs.

F. L. Fulton, boatbuilder at Antioch, California, has had a big run of repair work recently, the ways being occupied every day. The new 65-foot workboat R.V.L. 2 has been put in service and is highly satisfactory, her **Western-Enterprise** diesel giving her a 12 miles speed with good towing power.

The Wheeler Transportation Company of Stockton has placed an order with Fulton's yard for a twin screw workboat. This vessel will be 115 feet length, 30 feet beam, and 8 feet 6 inches depth. She will be propelled by two sets of **Western-Enterprise** diesel engines of 110 horsepower each.

The Rio Vista Transportation Company will soon place an order for a new workboat to replace the Dolphin recently burned. It is planned to make the new vessel larger and more powerful than the old one and she will have diesel engines.

Ets-Hokin & Galvan have been quite busy on workboat electrical installations lately. At their San Francisco quarters they have placed four Redwing engines, three Kohler lighting plants, four A. M. F. pump units, and four of their own manufacture lighting plants, the well-known E. H. G. type. In addition much equipment has been sold together with a very good run of repair work. As this season of the year is generally a bit slack, the volume of business handled has been most satisfactory. At the Wilmington branch, handled by Mr. Galvan, of the firm, equal activity has been maintained. Eight fishing workboats have had electrical installations made within the past few weeks, besides the complete electrical outfitting of fifteen yachts. Nine Cunningham electric winches and six sets of heavy storage batteries were also a part of the work done there. The firm also reports a fine showing in their ship chandlery business at Wilmington.

The cannery tender Sunlight of Ketchikan, Alaska. The Sunlight is powered with an 80-horsepower Worthington diesel.

Captain Don Pickard, a typical workboat operator of San Francisco Bay.

A new twin screw tug for Captain Lorentzen of Petaluma, California, has just been delivered by **Anderson & Cristofani,** San Francisco. This vessel, of 65 feet length, has two sets of **Atlas-Imperial** diesel engines of 65 horsepower each. She will be used in handling heavy barge tows on bay and river waters.

This yard has also in hand orders for three cannery barges to be used in Monterey Bay. Business in repairs has also been brisk the past month, the ways being occupied constantly.

A. W. Lawson, marine engineer of San Francisco, reports that he is making tentative plans for a 250-ton vessel for Mexican interests. Bids will be asked for both steel and wood construction. The proposed craft will be of light draft, propelled by two diesel engines of sufficient power to keep a sustained sea speed of 10 knots. She will also have passenger accommodations, and be fitted with all modern conveniences.

In addition to the motorship, bids will also be asked for the construction of two barges of 110 feet length and two of 80 feet. These barges will be shipped "knocked down" to a southern port and assembled there.

Beginning with the first of August, the San Francisco business of **Garvey & Palmer,** Pacific Coast agents for the Foos diesel engine, will be handled by A. G. Steltzner, as manager. Mr. Garvey of the firm will attend to the Seattle house, and Mr. Palmer will be at Los Angeles, with a new branch at Portland, at this writing with the Clyde Equipment Company, Seventeenth and Thurman Streets.

Mr. Steltzner is a graduate of University of California. He also served during the late war at the building and mechanical engineering work on the submarine fleet constructed by the Bethlehem Shipbuilding Corporation at its Union plant. He is also a member of the Society of Naval Architects and Marine Engineers and with his understanding of diesel engines for both shore and marine work, he will no doubt be successful with the rapidly expanding firm he is now associated with.

Winton Powered Wrigley Fleet

Five Fine Seagoing Towboats of the Wilmington Transportation Company All Operated by Winton Diesel Engines

ONE of the most impressive sights that the Los Angeles harbor has witnessed in many years was provided upon the occasion of the trial trip of the new Winton powered towboat Louie Black, built by Wm. Muller Shipyard, Wilmington, Calif., and owned by the Wilmington Transportation Company, one of William Wrigley's many Pacific Coast interests. As the new boat went down the channel on its first trip to sea, four other Wrigley towboats, the Milton S. Patrick, John N. Stewart, David P. Fleming, and D. M. Renton, all Winton powered boats, swept along in her wake. The five tugs were bedecked with flags, and surely no towboat ever received a more vociferous welcome, all the boats in the harbor and thousands of automobiles on shore joining in the reception, and telling the world that a new ship was about to taste salt water for the first time. Very appropriately the Los Angeles Fireboat No. 2, another Winton powered boat, stuck its nose out of its fire station as the new boat was passing and joined in the celebration.

Dropping her escorts at the breakwater, the new tug proceeded to Avalon, where the 100 guests aboard had lunch at St. Catharine's, returning in the evening to Los Angeles.

Wilmington Transportation Company's latest towboat, the Louie Black.

The table herewith shows the principal dimensions and equipment of the five tugs.

The new boat was christened in honor of Captain Louie Black, a veteran of the Wrigley fleet and one of the best known men in the work boat and towing business in Southern California. She met every requirement of the trial and is now in service in the Los Angeles harbor.

Since her successful trial, the Louie Black has been in practically continuous service in long coastwise tows. In this service she has given an excellent account of herself and has demonstrated more than expected economy in fuel consumption. It is predicted that the Wilmington Transportation Company will soon be building more of this type of tug to meet the growing demand for towboat service in the harbor of Los Angeles and along the southern California coast.

	Length	Beam	Draft	Engines
Louie Black	86 ft. 6 in.	24 ft.	11 ft. 6 in.	1-400 H.P. Winton Diesel
Milton S. Patrick	97 ft.	22 ft.	14 ft.	2-300 H.P. Winton Diesels (Electric Drive)
David P. Fleming	85 ft.	17 ft.	10 ft.	1-350 H.P. Winton Diesel
John N. Stewart	97 ft.	22 ft.	14 ft.	2-300 H.P. Winton Diesels (Electric Drive)
D. M. Renton	85 ft.	17 ft.	10 ft.	1-350 H.P. Winton Diesel

Two Winton diesel-electric towboats of the Wilmington Transportation Company, the Milton S. Patrick and the John N. Stewart.

A Five-Cylinder Western-Enterprise

By Renwick Z. Dickie

San Francisco tug Elizabeth, powered with 5-cylinder Western-Enterprise engine and equipped with Cloverleaf propeller.

THE effect of crank sequence on propeller performance was not considered important till brought to light by actual trial. The Western Machinery Company of San Francisco recently installed a 5-cylinder 135-horsepower diesel engine in the tug Elizabeth of the Harbor Tug & Barge Company of San Francisco. The tug Yankee of the same company has a 4-cylinder 135-horsepower engine built by the same company.

As both boats had a Cloverleaf propeller made from the same pattern at the time of installation, the data obtained at the dock trials are interesting as it gives a very just comparison and shows the exceptional merit of the 5-cylinder engine under a constant load. The following data will show what a large effect crank sequence has on propeller efficiency and may cause a radical change in the design of diesel engines.

The tug Elizabeth with the 135-horsepower Western-Enterprise 5-cylinder engine, 9-inch bore by 12½-inch stroke, turns a 53-inch diameter by 42-inch pitch Cloverleaf propeller 266 revolutions when tied to wharf with clear exhaust; crank sequence 72 degrees.

The tug Yankee with a 135-horsepower 4-cylinder, 9½-inch bore by 14-inch stroke, Western-Enterprise engine turns a 53-inch diameter by 42-inch pitch Cloverleaf propeller 235 revolutions tied to the wharf with clear exhaust; crank sequence 180 degrees. Both engines have the same size injection tips.

It will be seen that the 5-cylinder engine develops the same propeller torque with about 15 per cent less piston displacement than the 4-cylinder engine, the mean effective pressure being a trifle higher in the 4-cylinder engine.

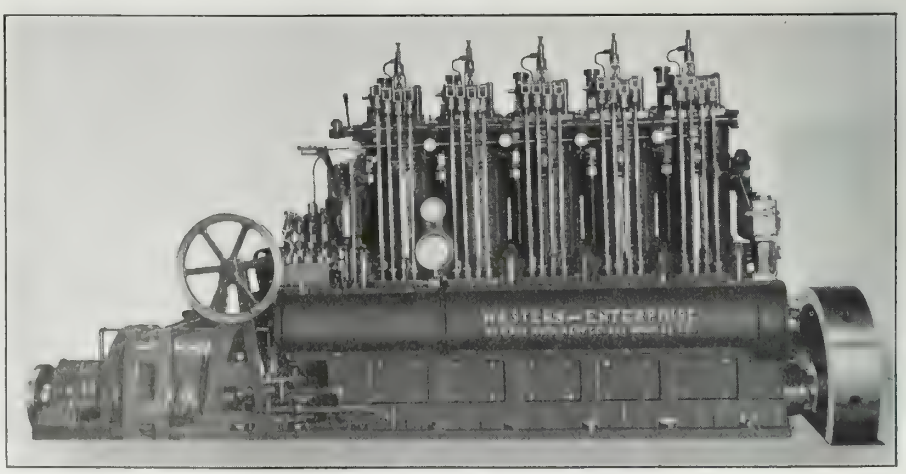
A coincidence worthy of note is that some manufacturers in Europe are now building 5-cylinder engines in large powers of 350 horsepower per cylinder which have resulted in repeat orders.

The tug Elizabeth was formerly a steam tug with a compound engine 8 by 16 by 12-inch stroke and a Scotch marine boiler. About two years ago she was bought by her present owners and rebuilt under the supervision of Russell Harris of the American Dredging Company, San Francisco. A 125-horsepower gas engine was installed, as she was to be used as a dredge tender for about two hours per day. Mr. Harris made quite an innovation on this installation, as in place of the usual intermediate shaft, a hollow steel tube was fitted with a universal joint on each end and a thrust fitted on the tail shaft. The bearing is fastened to a steel plate placed in the stern of the boat and spread over a large area making a very substantial job and distributing the thrust strain over a large surface.

After several months of service it was found the boat was working much longer hours than originally planned so it was decided to install a diesel engine as it would soon save the cost in fuel economy. A 5-cylinder Western-Enterprise engine was selected as it almost fitted the present foundation timbers, and would also operate with the least vibration. The unique system of Universal joints worked out so nicely that it was not necessary to reline the new engine.

A new Cloverleaf propeller was fitted from a special pattern for towing and with a loaded mud barge she turned 325 revolutions per minute loaded, and running light turned 335 revolutions per minute. The rating is 330 revolutions.

Steve Quinn, captain of the tug Elizabeth, who claims that a Cloverleaf propeller and a five-cylinder Western-Enterprise diesel will outpull anything of similar power on San Francisco Bay.



Five cylinder 135 horsepower Western Enterprise diesel.

A Big Little Coastwise Liner

A TALL-WATER workboat has just been completed at Anderson & Cristofani's yard, Hunter's Point, San Francisco. She is perhaps the best fitted out of her class on the Coast, and though she will fly the Mexican flag, is a product of San Francisco Bay yards and shops. This craft is the Viosca, built to the order of Rocholl Ruffo y Cia., La Paz, Baja California, who will run the Viosca between that port, Guaymas, San Jose del Cabo, and other Gulf of California ports.

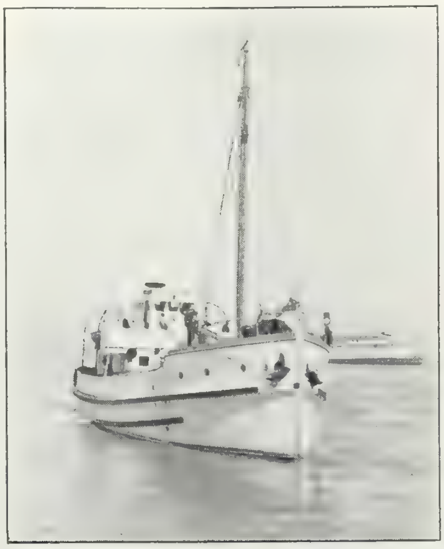
This vessel will carry principally leather and hides, her owners having been in that trade for the past fifty years. She has a master's cabin, and an owner's stateroom just aft the pilot house, is fitted with berths for eight of a crew in the forecastle, and has a nicely equipped galley and messroom at the foreward end of the main deck house. In addition she is fitted with four two-berth staterooms on the main deck aft.

The principal characteristics are:

Length over all	86 feet
Length B.P.	76 feet
Beam	21 feet
Depth	8 feet
Draft loaded	7 feet 3 inches
Draft light aft	7 feet 5 inches
Draft light forward	2 feet 6 inches
Carrying capacity	120 tons

The hull is copper fastened and copper sheathed to six inches above deep load water line.

The Viosca is a single screw vessel powered with a 110 horsepower Union diesel engine supplied by the Union Gas Engine Company of Oakland, Calif. An auxiliary air compressor and combination bilge and fire pump are driven by a gasoline engine. Electric lights are provided by an electric generator driven off the flywheel of the main engine, and by storage battery. The electrical equipment and wiring was supplied and installed by Ets-Hokin and Galvan of San Francisco.

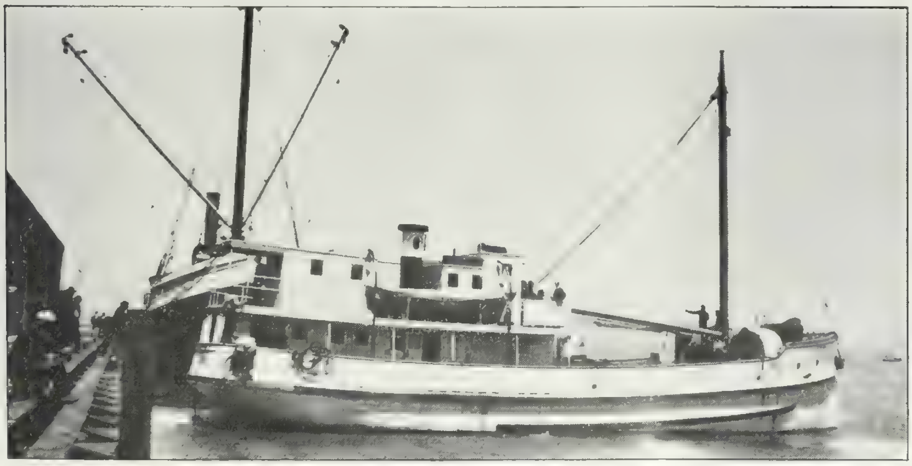


Bow view of the Viosca on her trial trip on San Francisco Bay.

On her light trial trip over the standard measured mile in San Francisco Bay the Viosca showed a speed of 8.14 knots (9.25 miles) at a propeller speed of 280 revolutions per minute. Loaded with 80 tons, corresponding to a draft of 6 feet 5 inches forward and 7 feet 5 inches aft, she made a speed of 7.36 knots (8.5 miles) at the same propeller revolutions. The vessel is equipped with one mast and with jib and main sail.

Immediately following her loaded speed trial she cleared for her home port, leaving San Francisco 3 p.m., June 29th, and arriving at La Paz, Baja California, July 6th, at noon, having covered 1722 miles, an average of 253 miles per day. Evidently Captain Dick Paulsen, an old sailing ship master, who took the Viosca south, had taken advantage with his sails of a heavy trade wind since these figures indicate an average speed for the six and seven-eighths days a little better than 10.5 miles an hour. The Union diesel performed 100 per cent, and was ready on arrival to start a return voyage immediately if necessary.

The Viosca was built to the design and under the supervision of A. W. Lawson, marine engineer and ship surveyor of San Francisco, whose special efforts brought the work to the bay boat yards. It is anticipated that a second similar vessel will be built in the very near future for other Mexican interests.



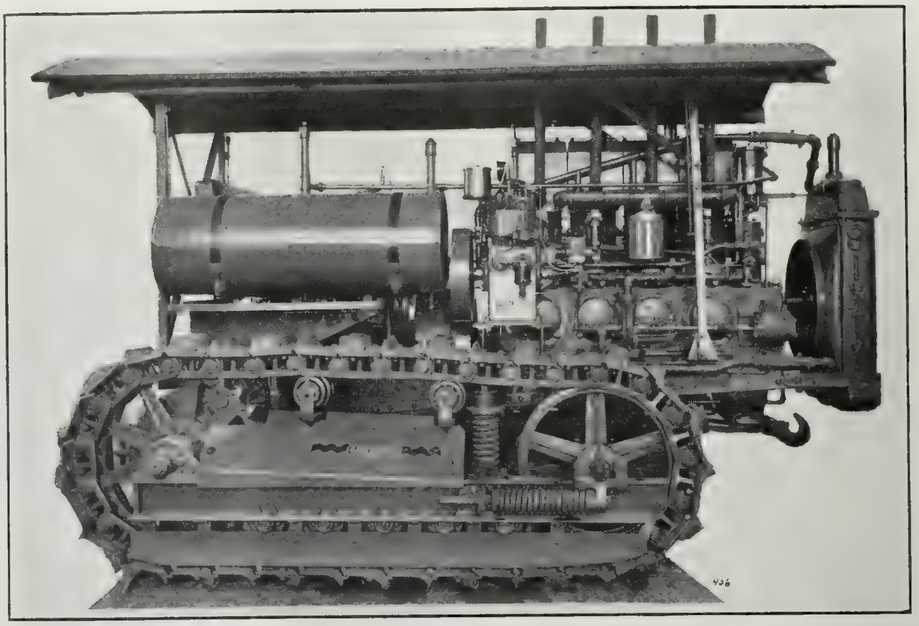
Broadside view of the Viosca leaving the pier at San Francisco for her initial voyage to La Paz, Baja California. The Viosca is powered with a 110-horsepower Union diesel engine.

Mianus Diesel on Display

THE Dahl Electric Company of San Francisco, distributors in Northern California for the Mianus diesel engine, have a 4-cylinder 75-horsepower Mianus on display at their warerooms on Mission Street, together with smaller motors, both gas and diesel. This latest addition to the display shows fine mechanical workmanship and embodies several special features which will be of interest to operators. Not the least of these is the compactness of design and freedom from outside moving parts. The engine is of the 2-cycle type, easily starting and fully reversible. Long bearings and over-sized crank shaft insure against breakage, and all parts are readily accessible should overhauling be necessary. Fuel consumption is claimed to be as low as any on the market. Fuel injection is on the solid injection system. One of the cylinders can be utilized as an air compressor for charging starting tanks, though it is asserted that this machine uses very little comparatively low pressure air for maneuvering or for getting under way when cold.

The Mianus Diesel Engine Company builds a line of diesel engines ranging from 7½ to 120 brake horsepower in both stationary and marine types.

An Overland Workboat



Broadside view of the latest overland workboat equipped by the Atlas-Imperial Engine Company, a California built Caterpillar tractor fitted with a 4-cylinder marine type Atlas-Imperial diesel engine.

THE Atlas-Imperial Engine Company has recently replaced the gas engine of a big tractor with one of its 4-cylinder 70-horsepower diesels, first designed and built for marine use. Several improvements and additions have been embodied in the new plant, making it more self contained. The cooling arrangements are obviously different than those used on marine jobs, a radiator on the lines of an automobile being employed. The illustration herewith shows very clearly the arrangement. It will also be seen that a small gasoline engine driven air compressor for use in starting is a part of the plant, making it entirely self contained.

One of these diesel tractors was recently put on the hardest kind of highway work to test out its ability to stand up. A 15-foot road scraper was handled with ease and at a very much less expense for fuel than with the gas engine drive at first used. A factor in efficient working is the fact that under the hardest pulls this tractor has no tendency to lift from the ground at the bow, as do most of the gas driven cats. The extra weight of the diesel holds the bow down and gives the tracks a better grip.

The Kaiser Paving Company of Oakland had this machine built and tested out to be certain it would be suitable before ordering several others. This company has secured a big part of the $17,000,000 contract for the building of some 400 miles of highway for the Government of Cuba. In addition to the many tractors which will be needed, there will be three Atlas-Imperial diesel engines mounted on Plymouth locomotive frames and wheels to be run on field railroads.

A further order for two sets of diesel driven electric power plants has just been completed for the same firm, to be used on the Cuban job. These units are mounted on rigid channel iron frames, electrically welded, supported by tractor wheels, making a very flexible and portable plant. As highway construction necessitates constantly advancing bases, this method of providing electric power is admirably adapted for the work.

All the units for the tractors, locomotives, and power plants are of Atlas-Imperial make and are of the same design and cylinder sizes, thus making spares interchangeable and allowing one unit to substitute for another with the least possible interruption of service.

Boatbuilding at Inverness

HIDDEN away behind the hills of Marin County, on the shores of Tomales Bay, is a small but well equipped boatbuilding yard. There, within the town limits of Inverness, a fishing village of sorts, John Rassmusen has been established for the past twenty years, building craft of various types, but mostly fishing and cruising vessels for the bay and river trade.

He now has in hand a specially designed cruiser of 40 feet length, 12 feet beam, and 3 feet draft. She will be schooner rigged, with a Wisconsin 6-cylinder, 45-horsepower gas engine. A feature of her build is that cabin accommodations are all amidships, 20 feet in length, with full beam of vessel. Aft of this are the galley and engine room. The engine is set "off center" to permit of space saving, and the whole arrangement has been worked out carefully to insure proper trim and stability. Though rather flat bottomed, the craft has good lines and should be a fine seaboat, a deep center board being available to keep her to windward when needed.

She has berths and all conveniences for a party of six and has exceptionally large space below as well as plenty of deck room.

The seagoing cruiser Wilmer R. was built and is owned by Mr. Rassmusen. In this vessel the builder and his wife made a four months' voyage to Mexico last year. It has a Hicks gas engine, and the owner says that it never gave them the slightest trouble during the cruise.

In addition to the larger craft, Rassmusen also builds special outboard motor boats which have given great satisfaction to those using them. In the last few months he has delivered four of these, they being very popular with fishing and boating parties on the bay.

Mrs. Rassmusen is quite adept at work around the yard. When they first started and cash was not plentiful, she worked with her husband as a helper, and being more than ordinarily handy, soon learned to do many jobs around the shop that generally are the work of skilled mechanics. Of sturdy German stock, Mrs. Rassmusen is a fine hausfrau as well as a good journeyman boatbuilder.

Auxiliaries—Ship Supplies—Marine Equipment

Importance of Temperature Measurement in Diesel Engine Operation

By J. W. Schwarz, Industrial Thermometer Department, Taylor Instrument Company

WITH the rapid development of the Marine Diesel Engine in the last few years it has become necessary to pay more attention to temperature measurement, because temperature control is of vital necessity in order to insure satisfactory operation.

There are three fundamental requirements of any power installation, whether it is Diesel electric or steam, and these are—1. Reliability. 2. Economy. 3. Low Cost of Maintenance.

Reliability or continuous operation can best be obtained by the use of reliable instruments which indicate at once when operating conditions depart from correct practice. For example: A sudden rise in the water outlet temperatures or a sudden drop in the exhaust gas temperature from one cylinder should immediately call the operator's attention to incorrect conditions, which can be rectified at once before damage, shut-down and costly repairs ensue.

Best economy of operation can be obtained with any Diesel Engine only by watching very closely to see that the proper circulating water temperatures are being maintained, that oil is kept at the right temperature, and that the exhaust gas temperatures are such that the individual cylinders are not being overloaded. Here it becomes imperative to rely on instruments, so that these temperatures may be indicated with an unfailing degree of accuracy and faithfully recorded day after day.

The exact temperatures for operating will vary somewhat with individual cases, but the manufacturer can advise what the best operating conditions are and the operator will soon learn what temperatures give the best results. When these temperatures have once been established it is easy with accurate instruments available for even an unskilled operator to operate the engine efficiently.

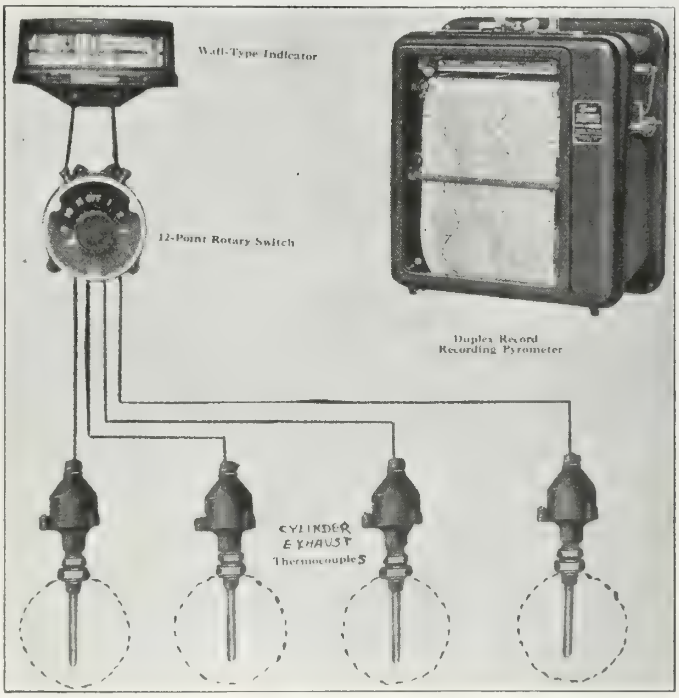
On tests recently run with large Diesel Engines built for the U. S. Shipping Board, which covered a thirty-day period, the following operating temperatures were recorded:

		Suggested Scale Range for Ther.
Cooling water to compressor	35°F.	0/100°F.
Cooling water from compressor	40°F.	0/100°F.
Cooling water to jacket	40°F.	0/100°F.
Cooling water from jacket	120°F.	30/160°F.
Cooling water to pistons	40°F.	0/100°F.
Cooling water from pistons	105°F.	30/160°F.
Exhaust gas temperatures	532°F.	*0/1200°F.
Lubricating oil to engine	95°F.	30/160°F.
Lubricating oil from engine	96°F.	30/160°F.
Fuel oil	89°F.	30/160°F.
Engine Room temperature	68°F.	0/120°F.
Outside air temperature	29°F.	—40/120°F.
Compressor air temperatures:		
First stage, to cooler	140°F.	30/240°F.
First stage, from cooler	43°F.	30/160°F.
Second stage, to cooler	139°F.	30/240°F.
Second stage, from cooler	40°F.	30/160°F.
Third stage, to cooler	138°F.	30/240°F.
Third stage, from cooler	42°F.	30/160°F.
Fourth stage, to cooler	234°F.	50/400°F.
Fourth stage, from cooler	77°F.	30/160°F.
Barometric pressure	29.09″	*Pyrometer

The above figures are taken from a 2900-h.p., 4-cylinder, Worthington, double-acting, 2-cycle Diesel engine.

In selecting instruments for taking temperature measurements there are two general classes which have been found to be most satisfactory on Diesel Engines. For indicating oil, air and water temperatures the so-called industrial type of thermometer with a separable socket connection is recommended. This thermometer consists of a glass mercury tube suitably mounted in a protecting frame, connection being made by a coupling nut to a separable socket or well, so that the thermometer can be withdrawn from the well at any time without interfering with operation. The outside stem of the thermometer is tapered to fit corresponding taper on the inside of the thermometer socket, so that metal to metal contact is assured, giving a quick-reading instrument. A thermometer of this type should be selected to have the following characteristics: 1. Permanent accuracy. 2. Mechanical design to withstand vibration on diesel engines. 3. Mechanical construction, such that it can be easily installed or easily removed when necessary without interfering with the operation.

For measuring exhaust gas temperatures the thermo-electric pyro-



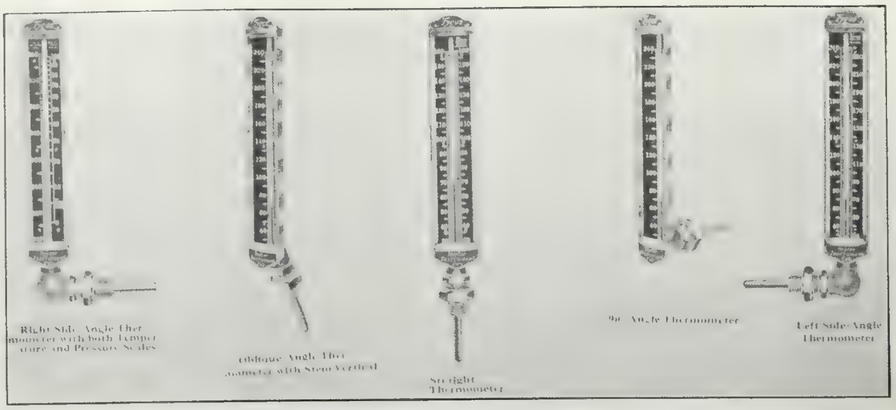
Arrangement of thermo-couples, Tycos indicator, and Tycos recording pyrometer for the visual indication and a permanent record of the exhaust temperatures of diesel engine cylinders.

meter is the most satisfactory as it will stand a sudden rise in temperature without injuring the instrument, while the mercury glass thermometer is only good for 950° F., and sudden rises in the exhaust gas temperature will break the thermometer.

An illustration shows the type of pyrometer and indicating system suitable for a 4-cylinder Diesel Engine, including both the indicator, the recorder, rotary switch, and thermocouples.

Such an instrument located on exhaust outlet from each cylinder will enable the operator to locate and promptly correct faults indicated as follows: Low temperature indication, which may mean loose tappet on fuel pump; leaky valve; leaky fuel line; dirty fuel nozzle. High temperature indication, which indicates improper adjustment of fuel pump, giving too much oil at each charge; poor governor adjustment; clogged spray tip, causing late injection, thereby giving a hot blast at end of cycle. Low compression due to leaky rings, likewise giving late burning.

Where temperature records are required the recording pyrometer can be connected in parallel with the indicator and a complete record of exhaust gas temperature obtained. This will enable the chief engineer to check the operating staff.


Right Side Angle Thermometer with both Temperature and Pressure Scales
Oblique Angle Thermometer with Stem Vertical
Straight Thermometer
90° Angle Thermometer
Left Side Angle Thermometer

Various types of Tycos thermometers.

It is generally agreed that a study of the exhaust gas temperature will at once tell the operator what the engine is doing and whether the loads are evenly distributed among the cylinders, so that this is one of the most important temperatures that we have to take. All the others are important also, but the exhaust gas records tell at a glance exactly what the engine is doing.

In general the list given of temperatures and instruments covers the most important temperatures to be measured and tells what kind of instruments are best adapted for these applications, but there are many other uses for instruments not touched upon here.

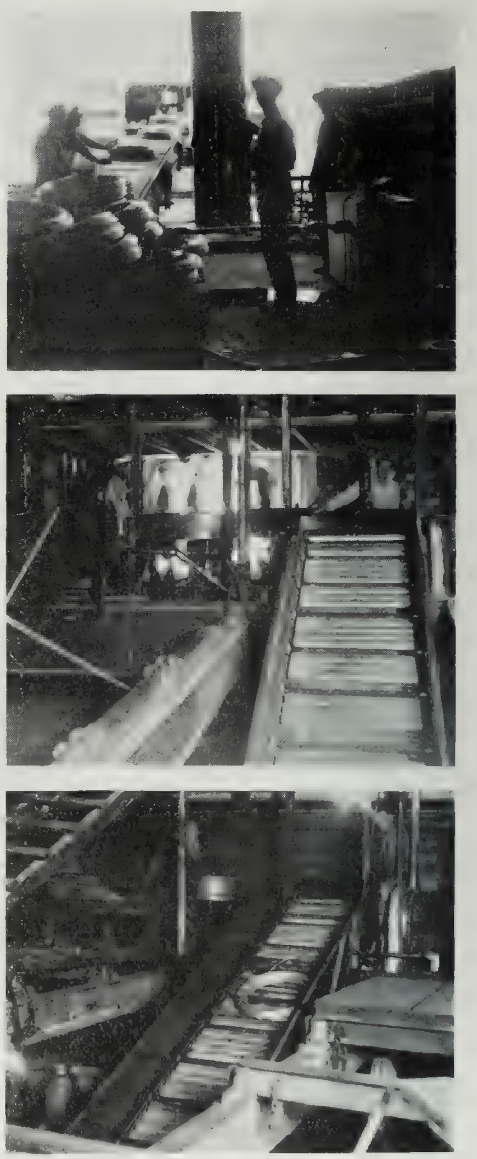
Handling Freight on a Passenger Liner

When the Los Angeles Steamship Company decided to build new modern passenger accommodations in the hull of the steamship City of Honolulu, one of the features dictated by its experience in handling steamer passengers on the Honolulu run was plenty of free open deck space for dancing and promenade and large uninterrupted public room spaces. To meet this requirement it was necessary to eliminate hatches in A, B, and C decks and handle freight through side ports. This condition gave an excellent opportunity to install a conveyor system for handling general cargo, and after careful investigation an order was placed with John F. Willard & Son, Los Angeles, who furnished two conveyors of the Matthews type. These conveyors were installed in two hatchways, one forward and one aft, and are showing very good efficiency and high speed in handling cargo.

These conveyor systems consist of a series of apron type power conveyors, whose ends are connected at each deck by means of a 180-degree Matthews gravity roller curve. The apron in these conveyors is made up of maple slats secured to heavy pintle chains at either side. These chains are supported at short intervals on 3-inch wheels mounted on steel axles. This construction carries the load with a rolling action and eliminates chain drag entirely.

The chain is driven by electric motor mechanically connected through spur gearing. The conveyor is completely reversible. Transfer from one section to another requires a slight amount of manual assistance on certain types of cargo. It has successfully handled a wide range of material, including practically everything from building brick to gunny sacks. Case pineapple, which is a considerable item in consignments from Honolulu, was handled with great dispatch and no damage.

As installed in the steamer City of Honolulu, these conveyors displace the noisy and comparatively inefficient winch system of handling cargo, and experience with this installation shows that the conveyor method can be worked out for this purpose with resultant savings.



Views of the cargo conveyor installed on the steamship City of Honolulu. Upper, extension of conveyor handling wire from dock into ship. Center, 180-degree roller curve on D deck. Lower, the 180-degree roller curve and hatch conveyors on E deck.

Centrifugal Pump Efficiency Guarantees

THE efficiency of a machine which has for its purpose the transfer or transformation of energy is ordinarily defined as the ratio of the energy output to the energy input. The energy input of a centrifugal pump is the energy applied to turning the shaft, while the energy output is calculated as the volume of fluid handled multiplied by the increase in pressure generated, or as the weight of fluid multiplied by the head pumped against. The total mechanical energy of a fluid, however, includes pressure head, elevation head and velocity head, all of which items must be taken into account.

The gain in pressure is readily measured by means of pressure gages connected to the inlet and outlet nozzles, respectively. Any difference between the elevations of the pressure responsive parts of the two pressure gages must be taken into account as elevation head. This is easily measured, or can be eliminated from the calculation by locating the two gages at the same level.

The remaining item, velocity head, is sometimes overlooked and sometimes misunderstood by the pump user, and is the subject of the present discussion. Velocity head is the vertical distance in which a freely falling body would gain the velocity being considered, and is equal numerically to the velocity in feet per second squared, divided by twice the acceleration of gravity in feet per second or in algebraical symbols, $\frac{V^2}{2g}$.

The velocity of the fluid as it enters the suction nozzle or leaves the discharge nozzle of a centrifugal pump is readily calculated by dividing the flow in cubic feet per second by the cross-sectional flow area in square feet. If the areas of the suction and discharge nozzles are equal, there is no correction for velocity head, but if one is larger than the other, the difference in velocity head is added to, or subtracted from, the pressure head developed by the pump, accordingly as the discharge nozzle is smaller or larger, respectively, than the suction nozzle. The rule given in the "Standards of the Hydraulic Society" reads:

"If the discharge pipe is of smaller diameter than the suction pipe, which is often the case, then it will be necessary to add to the total head, as shown by the gages, the difference in velocity head between that of the discharge and that of the suction pipe at the points where gages are connected. If the discharge pipe is larger than the suction pipe, the difference in velocity head must be subtracted from the total head."

From a point of view of energy transferred to the water in the pump, the theory of this rule is entirely correct, but it can lead to considerable error in evaluating the practical utility of a pump. The piping connections should also be considered, as will appear from the following example:

Suppose that bids are asked on a pump of 18 ins. nominal size to deliver 9000 gals. per min. against 35 ft. head, and that one manufacturer, figuring on a pump with 18 in. suction nozzle and 18 in. discharge nozzle, guarantees 82 per cent efficiency, while another manufacturer offering a pump having an 18 in. suction nozzle and a 16 in. discharge nozzle guarantees 82.5 per cent efficiency. Which is the better pump, other things being equal? It is assumed that on test each pump will show exactly the efficiency guaranteed. The pump credited with the higher efficiency, however, gets credit for its efficiency by virtue of a velocity head correction of

$$\frac{(14.4)^2}{(64.4)} - \frac{(11.4)^2}{(64.4)} = 1.2\text{ft., } 11.4\text{ft. per sec.}$$

being the velocity in the suction nozzle and 14.4 ft. per sec. the velocity in the discharge nozzle, and the question before us is, does the customer receive the full benefit of this velocity head?

If there is space enough to install a straight 16 in. x 18 in. increaser, from 60 to 70 percent of the velocity of the water as it leaves the pump may be converted into useful pressure head. It will not in general do to have the entire discharge piping of 16 ins. diameter, as that would lead to excessive pipe friction, in fact in practically all cases it should be larger than 18 ins. 30 per cent of 1.2 ft. is 0.36 ft., so that there will still be a net loss of about 1 percent of the total head, and the overall efficiency will be 99 percent of 82.5, or only 81.67 percent, as compared with the 82 per cent guaranteed for the pump having the 18 in. discharge nozzle.

In probably 95 cases out of 100, moreover, the pump will be installed with the discharge flange bolted directly to an elbow to connect with a pipe extending vertically upward to the ceiling or downward through the floor. The friction of a 90 deg. ell is commonly figured as equal to that of 50 ft. of straight pipe, on which basis, the pump with the 18 in. discharge nozzle will have a loss through the elbow of 1.63 ft., while the pump with the 16-in. discharge nozzle will have a loss through the elbow of 2.85 ft. The loss with a 16x18 in. increasing ell would be almost as great, because there would be practically no conversion of velocity to pressure in the elbow. There is accordingly an increased loss due to the use of the 16 in. discharge nozzle of 2.85 ft.—1.63 ft.=1.22 ft., or 3.48 per cent of the total head developed. Based upon readings taken at the outlet of the ell, the pump having the 18 in. discharge nozzle has a useful efficiency of

$$\frac{35-1.63}{35} \times .82 = 78\%$$

while the pump with the 16 in. discharge nozzle has a useful efficiency of only

$$\frac{35 - 2.85}{35} \times 82.5 = 75.7\%$$

The customer similarly pays an excessive price for a small discharge nozzle where a check valve is bolted directly to the pump flange, as is frequently done. At high velocities, friction losses through check valves are considerable. The friction through a 16 in. valve at 14.4 ft. per sec. velocity may, depending upon design, be as much as 6.1 ft., and through an 18 in. valve at 11.4 ft. per sec. velocity, 3.8 ft., or an additional loss through the 16 in. valve of 6.1—3.8=2.3 ft. Therefore, based upon the head remaining at the discharge from the check valve, the 18 in. discharge nozzle pump will show an efficiency of

$$\frac{35 - 3.8}{35} \times .82 = 73.1\%$$

while the 16 in. discharge nozzle pump will show

$$\frac{35 - 6.1}{35} \times 82.5 = 68.2\%$$

or about 7 per cent lower useful output than the 18 in. discharge nozzle pump.

In other words, the customer should consider the complete installation, including the piping arrangement which will be used with the pump, when comparing efficiencies, and he should bear in mind that a pump having the proper size of nozzle may give a greater useful effect, even though its guaranteed efficiency is lower. This applies particularly to low head pumps, where the velocity head constitutes an appreciable part of the total head.

As the velocity in the pump volute is always much higher than in the discharge nozzle, one of the problems of the pump designer is to convert this high velocity into pressure as efficiently as possible, but it is easier for him to leave the velocity high, clear up to the discharge nozzle, especially if he can persuade the user to give him credit for the entire gain in velocity head between suction and discharge nozzles.

The better showing made by the pump having a small discharge nozzle will be more than offset by loss in the piping unless an efficient straight increaser is put in between the pump discharge flange and the pipe line. Unless this could be done, the pump with 18 in. discharge nozzle in the above example would be much preferable to the pump with 16 in. discharge nozzle.

In any event, a pump which has a discharge nozzle smaller than the suction nozzle should not be given full credit for velocity head in comparing it with a pump having both nozzles of the same size, since it is impossible to convert 100 per cent of the velocity into pressure, even with the best piping layout. In most installations, as a matter of fact, no effort is made to obtain efficient conversion of velocity head into pressure.

Standard Steel Fishing Boats

By George J. Kuhrts Jr.

General Manager, Standard Boiler and Steel Works, Los Angeles

FOR years the fishing industry has demanded a low priced all-steel workboat, embodying the principles of safety, speed, capacity, and economy. Although various attempts have been made to build a type of steel craft that would meet these requirements, no practical model has heretofore been placed on the market.

Some time ago D. Liaman, assistant to Richard Sachse, consulting engineer for the Los Angeles Railway, completed an experimental all-steel model at the Standard Boiler and Steel Works in Los Angeles. Subjected to the most severe tests, the boat amply demonstrated its superiority in every detail over the best wooden boats built.

There is now being formed a corporation, to be called the Standard Shipbuilding Company, which will manufacture these steel workboats. The new company will make use of the Standard Boiler and Steel Works facilities.

The new boats will be of the same dimensions as the average wooden boat; that is, 8 feet by 40 feet, with displacement of 20 tons. Engineering computations, as in bridge building, are to be used in construction, and the work will be completed entirely from blueprints. The mathematical accuracy of construction under engineering principles will make quantity production relatively simple.

An interesting feature of construction in these workboats is the entire absence of rivets and bolts, the ⅛-inch steel plates being put together by electric welding. The plates are all of the initial range of curvature and are applied as they are—without tempering. Thus there is no danger of breaking, bending, or warping.

Computations show that the steel boats are five and one-half times as strong as the wooden boats and will weigh only half as much as wooden boats of the same dimensions. Facilities for the comfort of the fishing crew represent a vast improvement over the old type craft, there being a 6-foot clearance all around. The deck is also covered complete. Steel boats should have a greater fishing radius as they consume less fuel, carry more fish, and have adequate accommodations for a crew of four men.

These boats are painted with a special preparation of biturine enamel which penetrates into the steel 1/64th of an inch. Three coats are used; the first a sink primer; the second, anti-corrosion; and the third, anti-fouling.

Patents have been applied for on all details.

The Standard Shipbuilding Company will also manufacture a few boats of 100 feet length, 300 to 400 tons displacement, for coastal oil and gas transport. Construction of small all-steel pleasure craft is also planned.

Better Service on River Freight

THE California Transportation Company, in keeping with the need for improved service between San Francisco and Sacramento, recently installed electric lift trucks and platforms to expedite the handling of freight in connection with their two new steamers, the Delta King and Delta Queen.

Following their regular practice in keeping abreast of the times, this company tried out an Elwell-Parker electric lift truck about a year ago, together with 50 platforms, in the handling of fresh fruit from the Sacramento Valley.

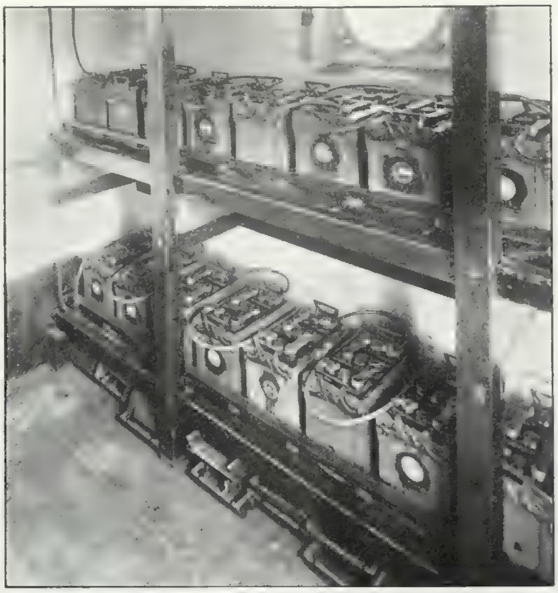
This fresh fruit, which is intended entirely for local consumption at San Francisco, is subject to damage in transit. In order to minimize damage, the fruit is loaded directly from motor trucks or cars to lift platforms and kept on these platforms while in transit on the boats.

This new system, which has found extensive use in many industries, has enabled the California Transportation Company to not only greatly expedite the movement of all freight but to deliver it to the consignee in a much better condition through a reduction in the number of handlings as compared to the old method of loading by hand.

Recent sales of Elwell-Parker electric trucks reported by Ira G. Perin, California distributor, include the following:

Hobbs Wall & Co. (steamship)	1
Petaluma & Santa Rosa Ry. Co.	2
California & Hawaiian Sugar Refinery	2
Encinal Terminals	2
Colma Vegetable Association	1
Sugar Pine Lumber Co.	1
Sacramento Navigation Co.	1
National Paper Products Co.	1
California Transportation Co.	1
Berkeley Transportation Co.	1

Interesting Battery Installation



Willard storage batteries on the U.S. transport Somme.

THE illustrations herewith show the United States army transport Somme and an interesting installation of Willard storage batteries recently made on that vessel by Julius Brunton and Sons Company of San Francisco.

These batteries are replacing Willard type PSW-612 batteries which were installed on the transport Somme during the war, in connection with the Mathews 6 K.W. emergency lighting system. They consist of 60 cells, 120 volts and are of the high discharge type.

The emergency lighting system is so arranged that the batteries automatically pick up the lighting load for a certain period of time using the batteries, and if the ship's power is not restored by that time the gasoline engine automatically cuts in and assists in carrying the emergency lights.

This automatic feature, combined with the well-known reliability of Willard cells, is especially valuable in times of emergency when continuous current for running and deck lights and for radio often makes a safe situation out of one that without light and means of communication would be very disastrous.

The Davis Pressure Regulator

AN improved automatic pressure regulator suitable for the accurate reduction of high steam pressures either at the boiler or on the line is a feature of the line of automatic valve specialties manufactured by the G. M. Davis Regulator Company of 422 Milwaukee Avenue, Chicago.

The difficulties of the balanced valve type of regulator when used where steam velocities may become high and which arise from the impact of currents of high velocity steam striking the bottom of the balancing piston and throwing the valve out of balance have been overcome completely in this regulator.

This has been accomplished by taking the control pressure which actuates the balancing piston from the center of the valve body and passing it to the piston through the hollow piston rod. The piston is entirely isolated from the rush of the gases except through this channel so that it is completely shielded from the unbalancing impact of high velocity discharges. This gives a very smooth and evenly balanced action which is an accurate average of the pressure and is not affected by the gas flow.

The regulator has no diaphragm and operates entirely without packing, springs or toggles. The piston operates in a bronze cylinder and is grooved and lapped so that it needs no other packing. There are no small ports to become clogged and no auxiliary valve mechanism.

In order to eliminate all danger of chatter an oil dashpot is fitted to the balancing lever. The pressure adjustment is made by altering the weights on the counterbalance arm which works entirely without springs so that only the constant force of gravity is used to maintain the balance of pressure. Coupled with the fact that the regulating mechanism is entirely free from all influence of high or low velocity flow this gives an extremely accurate and sensitive regulation which works without any attention or adjustment over violent fluctuations of pressure and for long periods.

The counterweight lever affords a simple means of testing the operation of the regulator and in addition the actual operation of the valve is easily observed at any time through the movement of the counterbalance. The adjustment for various pressures is simply made by altering the amount of weights on the counterbalance arm.

The counterweight and dashpot are carried on a swivel bracket which may be placed on either side of the valve.

The regulator is manufactured in a full range of sizes for handling initial steam pressures up to 300 lbs. per sq. in. Davis regulators were the first commercially successful regulators to be placed on the market and have been manufactured for more than fifty years.

A Compact Efficient Refrigeration Unit

A COMPACT, highly efficient refrigeration machine has been installed on the new cruising yacht now building at the Sausalito yard of J. H. Madden & Company for Mr. Morgensen. This machine, it is stated, is one of the most simple and, at the same time, reliable units on the market. It has many advantages which make it admirable for marine work, one of them being that its refrigerating gas is not dangerous and does not require any high pressures to absorb heat and produce a very low temperature.

The mechanical construction of the machine is of the highest type, it being built by a well-known Detroit firm, with all the close tolerance and exact fitting of an automobile. As the moving parts are few, danger of breakdowns is reduced to a minimum. Another feature is that the cooling gas is a derivative of a petroleum base and carries with it the natural lubricants. Thus it is not a "dry" gas and is not affected in any way by the motion of the vessel.

This machine is the Copeland, made in many different sizes to meet all requirements, and is handled on the Pacific Coast by George Camp Company of San Francisco, who guarantee the units and attend to installations and service both for marine and shore use. It can be operated from any light socket and uses a comparatively small amount of current. This will especially appeal to owners of vessels for on board ship the demands on electric plants are generally heavy.

Oil Purifiers on a Government Dredge

De Laval Installation Guarantees Pure Fuel and Lubricant on Dredge A. MacKenzie

DURING 1924 the Sun Shipbuilding Company delivered to the United States Engineers Department five diesel-electric seagoing hopper dredges for the harbor work of that department. These vessels are 268 feet 5 inches in length with a beam of 46 feet, a depth of 22 feet 6 inches, and a hopper capacity of 1250 cubic yards. The dredge drag and suction are capable of working at 40-foot depths. Each dredge is equipped with three 1000-brake horsepower McIntosh & Seymour 6-cylinder, 4-cycle, air injection diesel engines, each direct-connected to a 700-kilowatt, 500-volt, 150 revolutions per minute Westinghouse generator. There are two propulsion motors of 800 horsepower each, an 800-horsepower motor for driving the dredge pump, a 50-horsepower motor for raising and lowering the drag, and a large number of motors for various auxiliary purposes. A full description, with detail illustrations, will be found in Pacific Marine Review for August, 1924.

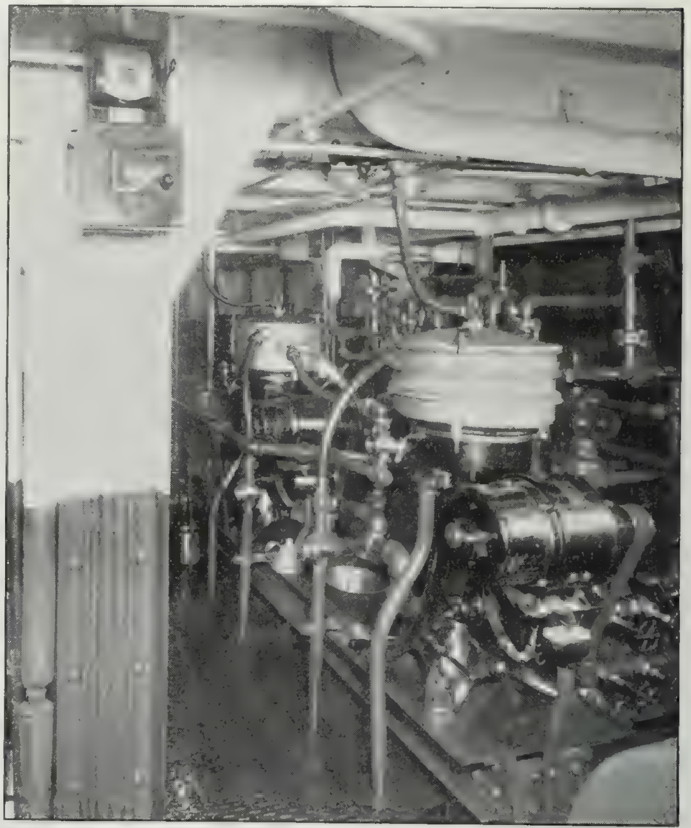
One of these dredges, the A. MacKenzie, being due recently at Mare Island, California, for annual overhaul and reconditioning, the efficient engineering staff at the California Navy Yard made a thorough investigation into the possible means of minimizing her machinery maintenance and increasing her efficiency. In the process of this investigation the records of many dredges were examined and it became apparent that those dredges which were equipped with a continuous centrifugal system for the clarification of lubricating and fuel oils were showing decidedly less maintenance cost and greater efficiency and fuel economy.

As a result of this investigation, the A. MacKenzie was equipped with De Laval oil purifiers in both the forward and the after engine rooms. In the after engine room a No. 360 standard type De Laval oil purifier takes care of the lubricating oil from the 100-horsepower main engine and from the two 225-horsepower auxiliary engines located there. In the forward engine room two No. 600 vapor-tight De Laval fuel oil purifiers are installed, one normally taking care of the fuel oil for all engines and the other of the lubricating oil from the two 1000-horsepower main engines located forward. These two vapor-tight purifiers are fitted with cross connections so that both may be used on either fuel or lubricating oils as conditions demand.

Provision was made in this installation for preheating of all grades of oil before purification by fitting electric heating elements in the oil supply lines.

These De Laval oil purifiers have now been in service under hard operating conditions for several months. The results fully justify the wisdom of the engineers in making the installation and have brought unqualified endorsement from the dredge operators and from the engineers' department. Careful record is kept of the amount of water and of solids removed from both lubricating and fuel oil and these records show that the positive protection afforded by this installation to the engines under its care will result in greatly reduced bearing and cylinder wear and savings in lubricating oil consumption.

The De Laval Pacific Company of San Francisco distributes and services De Laval products on the Pacific Coast. Its engineering organization is competent through long experience and research to solve problems in the purifying of lubricants and fuels for ships' machinery and engines. This ability and experience are at the service of Pacific ship operators.


De Laval vapor-tight oil purifiers installed on motorship East Indian. Two of this type are installed on the U.S. Army dredge A. Mackenzie

McIntosh & Seymour Appointment

FREDERICK M. FISK on July 1 became manager of the Pacific Coast office of McIntosh & Seymour Corporation, 815 Sheldon Building, San Francisco.

Frederick M. Fisk.

Mr. Fisk is well-known in his territory through former connection with various important engineering enterprises, and has had extensive diesel engine experience in the McIntosh & Seymour plant in Auburn, New York, and outside. Mr. Fisk is therefore thoroughly familiar with details and performance of McIntosh & Seymour units, and is exceptionally well qualified to cooperate in both marine and stationary power plant work.

Marine Insurance

Edited by JAMES A. QUINBY

Delay versus Sea Peril as Cause of Damage

THE old but always timely subject of proximate cause has received exhaustive study in the case of Amoroso vs. The Sea Insurance Company, decided on May 31st of this year by the New York Court of Appeals, which reversed a jury verdict for the assured in the lower court. It is indeed refreshing to find so able an exposition of marine insurance law in a state tribunal. Judge Crane's opinion is set forth below in the belief that it will be of benefit to shippers and insurers of perishable goods.

A-Smokin' of My Pipe

When I am at my office this balmy summer weather
My ancient briar pipe and I spend hours and hours together.
I tamp the bowl and turn the match, and puff, and puff, and puff.
(I really do not like to smoke—I do it for a bluff)
I chew the stem and look severe, and try my level best
To make folks think I am a male with hair upon my chest.

AND—

I wonder, as I clasp my hands
About my idle knee,
If the trout are biting in the lakes
Above Yosemite.
But when I'm really at a lake, I fear I'm of the type
That spends less time a-fishin' than a-smokin' of my pipe.
It seems to be the thing to do (puff-puff) at any rate,
Old Isaac Walton drove a hod and took his coffee straight.
And so, throughout vacation time, I nurse my pet dudeen,
It says to me that I am free, and life is all serene.

BUT—

I wonder, as the pungent clouds
Float lazily about me
Just howinell the office force
Can get along without me.

In the month of December, 1922, the firm of Puccio & Sternheim shipped from Palermo, Italy, 2040 boxes of lemons via the steamship Lancastrian, to the port of New York. On or about February 8th, 1923, the bill of lading for said boxes of lemons was purchased by the plaintiff through bankers in New York City and he thereupon procured from the Sea Insurance Company, Ltd., the defendant in this action, the policy of insurance upon which he has brought this action. At the time of the insurance the vessel and its cargo was on its way to New York. The chronological order of the events from the time the lemons were delivered to the steamship company until the vessel arrived at New York city is as follows: On December 22, 1922, the lemons were delivered to the steamship company at Palermo for shipment on the Lancastrian. On January 17, 1923, the Lancastrian sailed from Palermo, putting into Gibraltar three days later, January 20, for provisions and coal. On January 24 a sudden squall sprang up, and the Lancastrian drifted alongside the oil hulk Dragon. Either the ship dragged her anchor, or else the anchor broke. The Lancastrian waited until the wind died down, then steamed to another anchorage. Other than the tearing of the jigger mast shrouds, no damage was done to the Lancastrian. The Dragon, however, appears to have been damaged, for the next day, January 25th, the Lancastrian was libeled for 5000 pounds later reduced to 2000 pounds. A bailiff was put aboard the Lancastrian by the marshal of the Supreme Court of Gibraltar. On February 8, the insurance policy was taken out, as above stated. The vessel was released from arrest on February 16, but did not sail till the following week, February 23, arriving at New York March the 13th.

Cause of Damages in Doubt

The average length of time for a fruit freighter to make the voyage from Palermo to New York is twenty days. The Lancastrian took about fifty-five days, without considering that the lemons were delivered to the steamship company on December 26. Fifty-five days makes about eight weeks and the average life of a lemon is from nine to ten weeks. The lemons on arrival in New York were found to be damaged by reason of delay in transportation, and it is for this damage that the plaintiff has brought this action on the insurance policy. The defendant has resisted payment upon the ground that the cause of the damage is not one of the risks insured against; that the cause of the delay does not come within the terms of, but within the exceptions of the policy.

The delay, says the plaintiff, which caused the damage to the lemons was due to the collision of the Lancastrian with the Dragon whereas the defendant insists that the libel or arrest of the vessel was the cause, or a cause excepted from the policy. Although the defendant takes the position that the arrest was not the cause of the delay, yet it claims that if the plaintiff is right and the arrest did cause the delay, then this arrest by civil authorities is one of the things specifically excepted from the risks insured against.

Policy Conditions Examined

The policy being a marine insurance policy, is in the usual form with a rider covering special and additional risks. The Sea Insurance Company, Ltd., of Liverpool, makes insurance, lost or not lost, on merchandise shipped by the assured "touching of the adventures and perils * * * of the seas, men-of-war, fires, enemies, pirates, rovers, assailing thieves, jettisons, letters of mart and countermart reprisals, takings at

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sea, arrest, restraints and detainments of all kings, princes or people, of what nation, condition or quality, soever, barratry of the Master and Mariners, and all other perils, losses, and misfortunes, that have or shall come to the hurt, detriment or damage of the said goods and merchandises, or any part thereof." The rider attached to the policy also contains these words: "This company shall also be liable for decay, must or mold, etc., which may reasonably be supposed to have occurred in consequence of the stranding, sinking, burning or collision of the vessel or through delay resulting therefrom." Arrest or detainment by civil authority apparently is not within the risks touched by the policy.

The policy contains a number of exceptions or warranties upon the part of the assured. One of them reads as follows: "Warranted free of capture, seizure, arrest, restraint, or detainment and the consequences thereof or of any attempt thereat and whether as an act of war or by civil authority or by any person or persons whatsoever, lawless or otherwise, piracy excepted."

Having the incidents of the voyage of the Lancastrian and the terms of this policy of insurance, let us put the two together and see whether the defendant insured the plaintiff against the delay which caused the damage to his lemons.

Delay Not Due to Collision

The Lancastrian drifted into or bumped the oil hulk, Dragon. Neither the Lancastrian nor its cargo was damaged so as to cause any delay. The vessel could have proceeded on its way to New York at once so far as the evidence in this case shows. No delay was caused by the collision, if we interpret the words of the rider according to the ejusdem generis rule. The rider says: "Liable for decay . . . supposed to have occurred in consequence of the stranding, sinking, burning or collision of the vessel or through delay resulting therefrom"; that is, delay resulting from stranding, sinking, burning or collision of the vessel, which to my mind indicates that the collision must have damaged the vessel so as to cause delay. Nothing happened to the vessel which prevented it from proceeding on its voyage; it was in as fit condition before as after collision. No such results as are caused by sinking, stranding, burning or collision stopped the vessel in its course. By reason of the damage to the Dragon, the vessel was arrested. Of course, the arrest was due to the collision, but the delay, to my mind, was caused by the arrest, and not by a collision, within the meaning of the rider. The arrest was a distinct intervening cause but for which the vessel would not have been delayed one day. In Queens Ins. Co. v. Globe & Rutger Fire Ins. Co. (263 U. S. 487) it was said in speaking of a policy of insurance on a cargo against war risks: "On the other hand, the common understanding is that in construing these policies we are not to take broad views but generally are to stop our inquiries with the cause nearest to the loss. This is a settled rule of construction, and, if it is understood, does not deserve such criticism, since theoretically at least the parties can shape their contract as they like." (Bird vs. St. Paul F. & M. Ins. Co., 224 N. Y. 47; Insurance Company v. Transportation Company, 12 Wall, (U. S.) 194).

But whether this be so or not, we are all agreed that the delay from the arrest which the plaintiff says caused the damage to the lemons was specifically excepted from the policy. If it were not for this exception, it might be that the policy and the rider was broad enough to cover a delay caused by an arrest arising out of a collision even though the vessel and the cargo were in no way damaged. The exception, however, narrows this liability. The assurer warrants that the ship will be free from arrest, restraint, or detainment and the consequences thereof by civil authority. Here was an arrest by a civil authority for a period of about three weeks which the plaintiff claims caused the lemons to mold and spoil. The cause of the damage is within the exception or warranty free clause and not within the covering provisions. (Swinnerton v. Columbian Insurance Co. 37 N. Y. 174; Aktiebolaget M. Bank v. A. M. M. Ins. Co. 241 N. Y. 197; Insurance Co. v. Transportation Co., 12 Wall. (U. S.) 194; Boland's Ltd. v. London & Lancashire Fire, etc., Co., L. R. (1924) App. Cas. 836; Powell v. Hyde, 5 E. & B. 607; Cory v. Burr, 9 Q. B. D. 463; affirmed House of Lord, L. R. (1882) 8 App. Cas. 393; Robinson Gold Mining Co. v. Alliance Ins. Co. L. R. (1904) App. Cas. 359).

There is also a serious question arising on the evidence whether the plaintiff proved that the delay as a fact was caused by the arrest. The ship was short of coal and provisions. Arrangements had to be made to get the money to pay for both. The coaling went on at intervals up to the time of sailing, February 23, 1923 . The ship did not sail for a week after being released from arrest because the requisite amount of coal had not been bunkered. One hundred and eighty-five tons were put on board thereafter. The delivery of the coal and provisions was not retarded by the libel but by the lack of funds. It took time to make satisfactory financial arrangements. Harold G. Towler, of the London Coal Company, testified:

"On February 10, 1923, we were advised by the firm's London office that sufficient funds had been

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deposited with the firm's New York office to cover about 625 tons of coal. On February 15, 1923, the said firm was likewise advised that their New York office had received a further deposit which covered approximately 105 tons of coal. On February 21, 1923, the said firm received another advice that funds for a further 80 tons of coal (making a total of 810 tons) have been received." The ship was released, as I have above stated, on February 16, 1923. This witness also stated that the libel did not cause the delay in furnishing the coal.

Underwriters Not Liable

Whether there be any evidence, however, to sustain the finding of fact that the delay was caused by the arrest and collision, and not by the lack of coal and supplies, we need not determine, as we agree that the delay, if caused by the arrest, came within the warranty free clause referred to, making it a risk assumed by the assured and not by the defendant.

The judgment of the Appellate Division and that of the Trial Term should, therefore, be reversed and the complaint dismissed, with costs in all courts.

Cardozo, Ch. J. Pound, Andrews, Lehman, Kellogg, and O'Brien, J.J., concur.

Judgment accordingly.

"New Business"

In the great and glorious city of Bagdad, in the reign of Hassan the Merciful, there lived two men learned in physic and the science of medicine. And the first of these was an Honest Man, who suffered from a pernicious and ingrowing case of Ethics. With simple dignity and rare skill, he compounded herbs which cured the ills of those who called upon him.

But the second physician, who by the mercy of Allah was possessed of as great skill as the first, ran abroad shouting his wares in the market-place, and continually wore a purple robe with silver moons embroidered thereon. And he made much of curing those suffering no ill, and ministered unto the sick with gaudy phials of perfumed water. And the children of the Prophet flocked unto him—the people from the walled towns and the people from the olive groves of Abd-el-Shirkar—and if the old patients died or remained away, he cared not, for ever and anon the clamor of new patients outside his dwelling increased threefold over that of the day which had gone. So it transpired that he became a Successful Man, and was received at the court of Hassan, and his third wife gave alms to the sons of the Honest Man as they mingled with the beggars on the Road of Sighs.

And it came to pass that the youngest sons of these great physicians lived and died a hundred times, until, in the reign of Calvin the Calm, the son of the sons of the Honest Man became a Broker of Assurances, dwelling alone with his Conscience, his Ethics, and his Debts.

Now in the same city the 1927 model of the Successful Man was also a broker. And by the grace of the Prophet he hired many plausible young men in pinstriped suits, who went abroad through the land, shouting of Special Clauses and High Protection at Low Rates, and the Vizier of the Public Post was forced to assign two mail trucks to haul the new accounts which daily rolled into the office, for to each old account lost by false promises, a score of new ones clamored for admittance.

Verily it is written that he who deals with fools hath a large clientage.

Bill of Lading Limitation Held Invalid

As a general rule, it can be said that the limitation of value clauses found in ocean bills of lading are enforceable. Their legality, however, depends upon their reciprocal nature. If the carrier offers a choice of rates; so that the shipper is put in the position of voluntarily accepting incomplete protection to gain a lower freight rate, the limited value defense operates in favor of the ship-owner.

In the Penmorvah (1927 AMC 773), the French Line—which, by the way, has almost as many bill of lading forms as it has vessels—attempted to limit liability to 1000 francs per package, without offering the reciprocal benefit of a rate differential, and the Circuit Court of Appeals of the Second Circuit (New York) affirmed the lower court's decision in favor of the cargo owner.

"It is lawful," said the court, "for carriers by contract clauses, if fairly entered into and if they be fair and reasonable in their provisions, to limit the amounts for which they shall be liable. It is, of course, the result of mutual agreement which imposes the limitation. The alternative rates for the alternative limits of liability must be in force at the time of the shipment. Union Pacific R. Co. vs. Burke, 225 U. S. 317; Kensington, 183 U. S. 263; Hart vs. Penn. R. R. Co., 112 U. S. 331. The basis for enforcing the limitation of liability is upon the theory of estoppel. Union Pacific vs. Burke,

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supra. In the Burke case, the question was whether choice of alternative rights was essential to a valid limitation. There a shipment was made from Japan to an interior point in the United States by steamship and rail carriers under a through ocean form of bill of lading. The shipment was delivered to the rail carrier at San Francisco and started overland without new billing and was entirely destroyed in a railroad collision. The owner sued for invoice value and the carrier conceded liability but contended the amount was limited to $100 per package pursuant to provision of the bill of lading. There, as here, the bill of lading omitted reference to a choice or adjustment of rates based on that agreed valuation. The Supreme Court held that it was permissible for carriers to limit their liability to agreed values and that this right is based on estoppel. It exists only where a reciprocal benefit of choice of alternative adjustment of freight rate to value is tied to the release. Because in the Burke case a rail carrier was concerned, it is argued by the appellant that as such it could have but one published freight rate; still we think it is authoritative and covers all carriers, whether by rail or ocean freight. Western Union Telegraph Co. vs. Esteve Bros. & Co., 256 U. S. 566. In the Kensington, supra, a bill of lading provided that in no event was there to be a recovery of more than fifty francs per unit, at which the package was to be valued, unless an increased valuation be declared and extra freight paid, the court holding that the limitation in the clause to the words 'in no event' was void as against public policy and as against the Harter Act ,and that the alternative rate and recovery must be expressed. In U. S. Willow Furniture Co. vs. La Compagnie Generale Transatlantique, 271 Fed. 184, it affirmatively appeared that the French Line had and offered alternative ad valorem freight rate for the commodity which was not used. That case is different, because here there was no alternative rate for salt hides. The court said that inasmuch as no value had been declared and no bundle of willow was worth as much as 1000 francs, the libellant could recover the value at the port of shipment less what the injured goods realized in New York.

Below it was found as a fact that there was no choice of freight rates, based on valuation, open to the shipper. It also appears from a letter written by the Chief of Traffic of the appellant to ship brokers for this shipment, that wet salt hides were never carried under an ad valorem freight rate and that such hides were always carried by weight. The objection that this letter was improperly received is without merit. It was written to the shipper during the investigation as to the loss and was an admission as to such rates. The court was not obliged to accept the testimony of the appellant's employee in its New York office which tended to show the right of choice of rates. His testimony showed a lack of knowledge as to such matters at the Havre office. He was never connected with that office and did not know what rates on hides prevailed there. There is ample evidence to support the conclusion reached by the district judge.

Decree affirmed with costs."

Jettison Damage

Every so often some apparently simple point arises in a court of law—some point on which laymen and technical experts have been in accord for ages—and the greybeards of the bench proceed to make a difficult case out of it.

For example, the case of the Felix, reported on appeal to the Circuit Court of Appeals for the Second Circuit in 1927 A. M. C. 844, finds the court divided—at least to the extent of a lengthy dissenting opinion—as to whether damage to hull, caused by a jettison of deck-cargo, should be made good in general average under the York-Antwerp Rules of 1890.

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The master of the Felix, in endeavoring to float his stranded vessel, jettisoned a portion of his deckload of logs, one of which became entangled with the propeller, doing serious damage.

York-Antwerp Rules Involved

The bill of lading issued by the master and accepted by the shipper provided for the York-Antwerp Rules of 1890, the first two sections of which read as follows:

"Rule I—Jettison of Deck Cargo.

"No jettison of deck cargo shall be made good in general average.

"Every structure not built in with the frame of the vessel shall be considered to be part of the deck of the vessel.

"Rule II—Damage by Jettison and Sacrifice for the Common Safety.

"Damage done to a ship and cargo, or either of them, by or in consequence of a sacrifice made for the common safety, and by water which goes down a ship's hatches opened or other opening made for the purpose of making a jettison for the common safety, shall be made good as general average."

In both the District Court (see 1926 A. M. C. 338) and the Appellate Court, it was held that the damage caused by the log to the hull of the Felix was properly allowable in general average under the above rules.

It has been the universal custom of adjusters to allow in general average items of damage to bulwarks, decks, and the like, caused during jettison of deck cargo, even where the jettison itself was not recoverable under the York-Antwerp Rules. The reason for this is twofold.

In the first place, the rules themselves, in plain language, dictate such practise. After providing that no jettison of deck cargo shall be made good, the framers of the rules take care to specify, in Rule II, that "damage to a ship and cargo, or either of them, by or in consequence of a sacrifice made for the common safety, . . . shall be made good as general average."

The dictates of equity, as well as the sanction of agreement, support such allowance. The theory of general average demands that those who benefit from a sacrifice shall be called upon to make good the amount sacrificed. Deckload is specifically excluded from receiving such benefit—presumably as a sort of historical penalty for interfering with the proper working of the vessel, and inviting disposition by jettison. But in other respects, deck cargo bears the same relation to the adventure as other interests. If saved, it must contribute in general average, even though it cannot receive an allowance for jettison. Consequently there seems to be no logical reason why damage caused by jettison of deckload should not be made good. Any other rule would result in penalizing the shipowner or innocent cargo owner, instead of the owner of the deckload.

Why the Dissenting Opinion?

It is not to be wondered that the court reached the decision it did. Our chief source of surprise comes from the fact that the appellants thought enough of their case to appeal it, and that one of the judges of the Circuit Court of Appeals (Manton) thought enough of it to write a dissenting opinion.

This dissent is based on the contention that, as Rule I excludes deck cargo from allowance, it must be taken to exclude damage done in jettisoning deck cargo. The learned judge is guilty of an elaborate non sequitur when he argues that, since damage done by jettison is allowable when the jettison is allowable, therefore no damage can be allowed in general average which is caused by a jettison which is not allowable.

We sincerely trust that this case has definitely settled a question which, on the face of it, should have required no litigation in the first place.

Book Review

A Glossary of Sea Terms, by Gershom Bradford, 205 pages, profusely illustrated; bound in blue buckram with gold stampings; published by Yachting, Inc., 25 West 43rd St., New York.

Would you recognize a Swifter or a Cat Harpin if you met them on a moonlit evening? Can you throw a parbuckle on a barrel? Did you ever "beat the booby" or make a "baggy wrinkle?" The sea has a language all its own and Bradford has given us a distinct contribution to the interpretation thereof.

If any reason for the production of this reference work needs to be given it is perhaps best expressed in the words of the preface:

"The language of the sea has become extensive in consequence of the interminable parts of a vessel, its intricate rigging, the many types of craft, various maneuvers, and the precise way of doing things.

Some terms have many meanings, some have different interpretations in different localities, and some are vague at best. Even such commonplace terms as 'a fair wind' or 'catching a crab' will often start a controversy versial discussion. The attempt has been made here to give the best sea usage of this and other days.

This work has been compiled from the view point of the seaman for the information and pleasure of all those interested in the sea, ships, navigation, and sea routine. It does not cover the engineer's important part in seafaring — that would make another book. It has been the compiler's endeavor to fill its pages with live terms and also those semi-obsolete names that one is liable to run across in our nautical histories and sea stories.

To thousands of professional and business men the proper interpretation of nautical terms is of vital importance; students of naval and maritime history will find in them the real depth of strategic seamanship; to the multitudes of sea-yarn readers the best of the action lies mostly hidden in the strange sea language; with yachtsmen there is desired consistency of keeping the speech as seagoing as their boats; and young men entering sea life soon discover that sailors judge new shipmates by their use of the vernacular."

Stability and Seaworthiness of Ships, by T. B. Abell, 300 pages, 160 diagrams, many tables, bound in blue buckram with gold stampings; published by the University Press of Liverpool, Ltd.

This is a very handy and timely volume, written by the professor of naval architecture of the University of Liverpool as a "text book for officers of the Merchant Marine and for all concerned with the loading of ships." Without too much technical discussion the text makes very plain the effect of various conditions of ship structure and cargo stowage.

American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Shipbuilding Work in Prospect

KEY SYSTEM PLANS EXPANSION

The Key System Transit Company of San Francisco is now undergoing a change in its executive staff and A. J. Lundberg, member of the brokerage firm of A. J. Barth & Co., has been elected to the presidency. The most important announcement made by Mr. Lundberg is that the company proposes to enter the automobile carrying trade on San Francisco Bay. This company has heretofore confined its business to the carriage of passengers across the bay and the operation of extensive interurban lines in the Eastbay section. This expansion is contingent upon permission being granted by the California Railroad Commission and the successful financial arrangements which the new executive officer hopes to make.

The plan is to inaugurate a direct ferry service from the Ferry Building, San Francisco, to the Key mole on the Oakland side of the bay along the shortest and fastest possible line, which will entail the building of an automobile highway from the Oakland mainland to the mole and the building of new slips and boats.

It is understood that tentative plans for two and possibly three of the largest and fastest steel automobile ferries on San Francisco Bay are now being held by the company pending decision to go ahead with this program of expansion.

There has been some discussion and negotiations with the Railroad Commission concerning a consolidation of the services of the Southern Pacific Company and the Key System Transit Company, but the Key System will, under its new management, probably go ahead with their individual plans for development of the automobile ferry business.

BETHELEHEM, UNION PLANT, RECEIVES ORDER FOR INTER-ISLAND STEAMER

The Matson Navigation Company, San Francisco, acting as agents for the Inter-Island Steam Navigation Company, of Honolulu, on July 29 awarded a contract to the Union Plant of the Bethlehem Shipbuilding Corporation, San Francisco, for the construction of a modern passenger and freight steamer for service between Honolulu and the Island of Kauai. The contract price was not given, but is said to approximate $1,500,000. This is the largest single order placed at a San Francisco Bay shipyard for several years, and is a very welcome one at this low ebb of shipbuilding work.

The vessel is to be twin screw, 310 feet long, 48 feet beam, 16 feet 6 inches draft, with twin double-reduction geared turbines developing 4000 horsepower and giving the vessel a speed of 15 knots. Accommodations will be provided for 218 first cabin passengers and 100 steerage; also there will be provision for freight and automobiles.

VESSELS FOR MEXICAN INTERESTS

A. W. Lawson, marine engineer of San Francisco, at 1 Drumm Street, reports that he has tentative plans for a 250-ton vessel for Mexican parties. Bids will be asked for both wood and steel construction. The vessel will be of light draft and powered with two diesel engines. She will have passenger accommodations.

Mr. Lawson will also ask for bids for two 110-foot barges and two 80-foot barges to be shipped knocked down to a Mexican port.

Anderson & Cristofani of San Francisco recently completed an 86-foot vessel, the Viosca, for Mr. Lawson's order, and it is believed the new craft will be similar to this.

According to reports from Mexican sources, it is rumored that the Mexican Government plans construction, for the Mexican Navigation Line, of two 5000-ton combination passenger and freight steamers.

NEW FERRY PLANNED

Captain John L. Anderson, president of the Kitsap County Transportation Company of Seattle, recently announced that his company will shortly let contract for a 200-foot ferryboat with a capacity for 1000 passengers and 90 automobiles. This vessel will be operated between Seattle and Bainbridge Island.

She will be equipped with Washington-Estep diesel engines of 800 to 1000 horsepower.

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PLANS CONVERSION OF SHIPPING BOARD VESSELS TO DIESEL-ELECTRIC DRIVE

At the request of Commissioner William S. Benson, authority has been granted by the Shipping Board for the employment of Gibbs Brothers, Inc., of New York, and Rear Admiral D. W. Taylor, U. S. N., retired, jointly to prepare plans and specifications for the conversion of the Shipping Board vessels Defiance, Courageous, and Triumph to diesel-electric drive.

Admiral Taylor and William Francis Gibbs have been working together on experiments relative to the possibilities of increasing the speed of ships by alterations to the hull line and the installation of diesel-electric propulsion equipment.

The Shipping Board has sold the steamers West Helix and Westmount to Robert W. Malone of Washington, B. C., for $310,000. Both vessels are to be converted to oil burners.

POWERFUL DREDGE FOR GREAT LAKES

The Great Lakes Dredge and Dock Company of Chicago has sent its president, John F. Cushing, to Portland, Oregon, to study the operation of the four hydraulic dredges operated by the Port of Portland. Mr. Cushing announced that an order has been placed with the Manitowoc Shipbuilding Company, Manitowoc, Wisconsin, for a 5000-horsepower diesel-electric dredge. The Port of Portland is the owner and operator of the diesel-electric dredge Clackamas, the world's most powerful diesel-electric suction dredge.

NEW BARGES FOR PORTLAND

The Oregon Tug and Barge Company, Portland, Oregon, will call for bids soon for six new steel barges for use on the Willamette River.

SMALL ATLANTIC COASTWISE FREIGHTER

Eads Johnson, naval architect, 115 Broadway, New York, is preparing plans for a diesel-electric freighter for the Middlesex Transportation Company of New Brunswick. A 250-horsepower diesel engine will be installed.

NEW DREDGE

The State Board of Harbor Commissioners at San Francisco have directed their chief engineer, Frank E. White to prepare plans for the construction of a bucket dredge and two self-dumping scows for work on the San Francisco waterfront. Funds are available in the present budget for this purpose. The dredge and scows are to take the place of the present equipment which is becoming decrepit and will be junked on completion of the new dredge. This job will probably figure around $200,000.

PULVERIZED COAL EQUIPMENT

The Shipping Board on July 6 authorized the installation of apparatus to permit the consumption of pulverized coal as fuel on the S. S. Mercer. The Mercer is a cargo carrier of 9,730 tons deadweight carrying capacity and she will be used in one of the regular runs of the Merchant Fleet Corporation where careful tests will be made to determine the suitability and relative economy of pulverized coal fuel. The work of installing the pulverizing apparatus, stokers and furnace changes will be done at the Philadelphia Navy Yard.

Recent Shipbuilding Contracts

Newport News Shipbuilding and Dry Dock Company during June the Panama Pacific Line of the International Mercantile Marine Company a sister vessel to the California now nearing completion at that plant, 600 feet long, 80 feet beam, 30 feet draft, 22,000 tons displacement, 17,000 horsepower, 18 knot speed, steam turbo-electric drive, and to cost approximately $7,000,000. Undoubtedly a third sister will be added to this fine pair of liners in the near future.

Newport News Shipbuilding and Dry Dock Company during June signed a contract with the U. S. Navy Department for two light cruisers CL-30 and CL-31.

This yard also reports a contract from the Chesapeake Steamship Company of Baltimore for a passenger and freight steamer which will cost in the neighborhood of $1,000,000. The vessel will be similar to the steamer City of Annapolis, which was rammed and sunk early this year.

The Supple and Martin Shipbuilding Company of Portland, Oregon, on July 6, was awarded a contract for $29,165 to build a wooden ferryboat hull for operation between St. Johns and Linnton, Oregon, across the Willamette River. Diesel engines have been ordered from the Atlas-Imperial Engine Company on a bid of $25,249.

Dubuque Boat and Boiler Works, Dubuque, Iowa, has been awarded contract for the construction of a stern-wheel towboat for the Inland Waterways Corporation, Washington, D. C., for service on the upper

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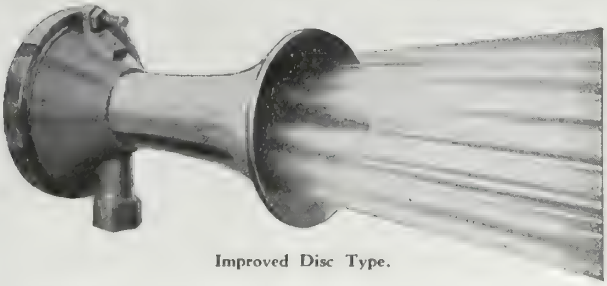

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Mississippi River. The boat will be 132 feet long, 35 feet beam, and 3 feet 6 inches draft. She will be equipped with Nordberg steam engines developing 600 horsepower and equipped with Foster steam generator and superheater and Coen oil burners on boilers. The price is $168,375 and 270 days' time.

Spear Engineers Corporation, Norfolk, Virginia, was awarded contract for construction of a steel ferryboat for the War Department for operation between Governor's Island and other points on New York harbor. A Bessemer 6-cylinder diesel engine of 420 horsepower will supply the motive power to this boat, which will have a length of 128 feet. The cost will be $207,000.

Buffalo Marine Construction Corporation, Buffalo, has a contract for two ice-breaking tugboats for the New York Commission of Canals and Waterways, T. F. Farrell, Commissioner, to cost $88,500.

Howard Shipyards and Dock Company, Jeffersonville, Ind., has an order for eight additional steel barges for the U. S. Army Engineers at St. Louis.

Midland Barge Company, Midland, Penn., has an order from the Inland Waterways Corp. for five additional barges.

Marine Iron and Shipbuilding Co., Duluth, Minn., has an order from the U. S. Engineers, Milwaukee, for a steel towboat and six steel barges for use on the Erie Canal, at a cost of $185,000.

F. L. Fulton, Antioch, Calif., has an order from the Wheeler Transportation Co., Stockton, for a twin screw towboat to be 115 feet long, 30 feet beam, and 8 feet 6 inches depth, to be powered with Western-Enterprise diesel engines of 110 horsepower each.

This yard also has an order for a diesel powered freight boat to replace the Dolphin of the Rio Vista Transportation Company, recently burned.

New Coast Guard Cutters

U. S. Coast Guard have awarded to **Bethlehem Shipbuilding Corporation** a $3,172,500 contract to build five first class coast guard cutters. These vessels will be 250 feet long, 42 feet moulded beam and will have 3,000 horsepower in steam turbine electric propulsion machinery. Order for machinery has been placed with **Westinghouse Electric & Mfg. Company.**

This plant has also received a contract from Crew, Levisk & Co. of New York for the construction of a small tank steamer for Atlantic Coastwise trade between New York and Philadelphia.

Big Passenger Conversion Job

Todd Dry Docks, Inc., of Seattle, have been awarded a contract to convert the Comfort, a naval hospital ship, into a first class passenger and freight steamer. The Comfort was formerly the Ward liner Havana and was commandeered by the Navy during the war. She was recently purchased from the Navy by the Atlantic, Gulf and West Indies Steamship Company, and when conversion is complete she will be used in the Ward Line again as a spare ship. The work involved in this contract includes: The installation of six new water-tube boilers; overhauling of propulsion machinery and auxiliaries; installation of new electric cargo winches; and rebuilding of state rooms, public rooms, galleys, pantries, and deck spaces to accommodate 25 first class passengers. This work will involve a cost of at least $800,000. Plans and specifications were prepared by Theodore E. Ferris, naval architect, New York.

Bay Barge Contract

The General Engineering and Drydock Company of Alameda, Calfornia, has received an order from the Pacific Portland Cement Company for five gravel barges of wooden construction, each 106 feet in length by 32 feet beam by 9 feet 4 inches depth.

River Steamer

The Nashville Bridge Company, Nashville, Tenn., reports new contracts as follows: One steel steamboat hull 96 feet long by 24 feet beam by 4 feet 6 inches loaded draft; two steel deck barges, 100 feet long by 24 feet beam by 5 feet loaded draft; one steel barge 56 feet long by 12 feet beam by 2 feet 6 inches loaded draft.

River Barges

The Midland Barge Company, Midland, Pa., reports contracts for five additional barges from the U. S. Inland Water Ways Corporation. These barges will be 126 feet long, 33 feet beam, and 7 feet 6 inches loaded draft.

Reconditioning Transport

The Mare Island Navy Yard, Vallejo, Calif., is reconditioning the U. S. Army transport Grant. Very extensive repairs and changes are contemplated for this vessel. The work now undertaken involves two decks and is estimated to cost in excess of $200,000. Later the balance of the vessel will be overhauled.

New Sand Carrier

The Collingwood Ship Yards, Ltd., Collingwood, Ontario, report the construction for delivery about September 1 of a sand carrier for the Interlake Transportation Company, Ltd., of Montreal. This vessel is 252 feet long, 43 feet 6 inches beam, and carries 2,200 tons on 14 feet draft. Her propulsion machinery consists of two 13 feet diameter Scotch marine boilers and one 700-horsepower triple expansion steam engine.

The American Bridge Company reports an order for five additional covered barges for the U. S. Inland Waterways Corporation. These barges are 126 feet long by 33 feet beam by 7 feet 6 inches depth.

News from the Shipyards

KEEL LAYINGS

Alki, fireboat for City of Seattle, by Pacific Coast Engineering Co., July 7.

Two carfloats for Pennsylvania Railroad in June by American Brown Boveri Electric Corp.

Sand carrier for Interlake Transportation Co., Ltd., by Collingwood Shipbuilding Co., April 28.

Carfloat for Lehigh Valley Railroad by Federal Shipbuilding and Dry Dock Co., June 6; carfloat for D. L. & W. Railroad, June 20.

Four steel barges for U. S. Army Engineers by Howard Shipyards and Dock Co., June 15 and 17.

Three deck barges for stock by Nashville Bridge Co., June 15.

Dredge for McWilliams Dredge Co. by Nashville Bridge Co., July 10.

Davie Shipbuilding Co., Lauzon, Quebec, on June 1 laid the keels for two 496-foot passenger steamers for Canada Steamship Lines, Ltd., of Montreal. These vessels will be used in the Montreal-Quebec service and will be fitted for oil burning.

Keel for the 85-foot fireboat for the City of Portland, Oregon, was laid on July 7 by the Baker Construction Company, Portland.

(Continued on Page 396)

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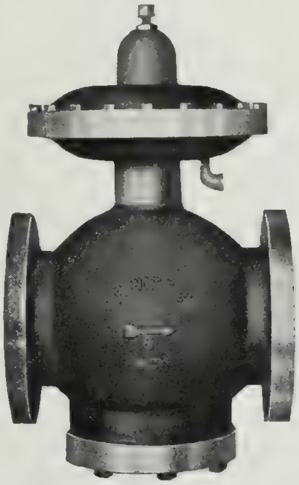

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Progress of Construction

Pacific Coast

BALLARD MARINE RAILWAY CO., INC.,

Seattle, Wash.

Not named, hull J 89, yacht for E. Michelsen, Seattle; 44 L.B.P.; diesel eng.

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT

Potrero Works. San Francisco

Purchasing Agent: O. W. Streett.

Mendocino, hull 5333, double-end diesel electric vehicular ferryboat for Northwestern Pac. R.R., San Francisco. 256′ L.O.A.; 44′10″ beam; 19′ depth; four Nelseco diesel engines. 450 H.P. each; launched April 14/27; **delivered June 22/27.**

Seven steel dredge hulls for U. S. Smelting & Refining Co., Oakland, Calif.; 140 ft. long; 10 cu. yards capacity.

GENERAL ENGINEERING & DRY-DOCK CO.,

Alameda, California

Purchasing Agent: Al. Wanner.

Golden Poppy, hull 4, diesel-electric wooden auto ferry for Golden Gate Ferry Co.; 240′ L.B.P.; 44′ beam; 11′ 6″ loaded draft; 13 knots speed; 3-400 B.H.P. Ingersoll-Rand diesel engines, direct connected to Westinghouse generators. keel Nov. 22/26; launched April 2/27; **delivered.**

Golden Shore, hull 5, sister to above; keel Feb. 4/27; launched Apr. 30/27; **delivered.**

Santa Rosa, hull 6, diesel-electric, steel automobile ferryboat for Southern Pacific Co.; 236′ L.B.P.; 44′ 10″ beam; 12′ 6″ loaded draft; 13 knots speed; 4-450 B.H.P. Nelseco diesel engs. connected to General Electric generators; keel Oct. 28/26; launched Mar. 17/27; **delivered.**

Hulls 7-11 inc., 5 wooden gravel barges for Pacific Portland Cement Co.; 106 L.B.P.; 32 beam; 9′4″ depth.

J. C. JOHNSON'S SHIPYARD

Port Blakely, Wn.

Sally S., hull 95, cannery tender for Sunny Point Packing Co., Seattle; 75 by 17 ft.; launched Apr. 21/27; **delivered May 23/27.**

Doris E., Hull 106, cannery tender and towboat for Sunny Point Packing Co, Seattle; 75x17 ft.; launched Apr. 21/27; **delivered May 23/27.**

Ruth May, hull 110, trolling boat for Mike Mathison, Port Blakely, Wn.; 45x6x4ft. 6in.; **delivered June 13/27.**

Hulls 113-114, two fish scows for Sunny Point Packing Co., Seattle; 62x18x4ft. 6in.; **delivered May 23/27.**

Hull 116, boat for Thomas Jacobson, Seattle; 64′x15′x7′4″. **delivered June 30, 1927.**

Hulls 120-121, two scows for stock; 100x36x8′8″; **launched June 21 and 24/27.**

THE MOORE DRY DOCK COMPANY

Oakland California.

Secretary and Purchasing Agent, Nat Levy.

Redwood Empire, hull 173, diesel-electric, steel, vehicular ferryboat for Northwestern Pacific R.R.; 236′ L B.P.; 44′10″ beam, 12′6″ loaded draft; 13 knots speed; 1250 S.H.P. Nelseco diesel engs.; connected to Westinghouse generators; keel Dec. 8/26; launched Apr. 30/27. **delivered July 15/27.**

Hull 174, steel carfloat for Southern Pacific Co.; 258 by 38 by 7′ 9″ loaded draft; 14 cars capacity; keel June 20/27.

PACIFIC COAST ENGINEERING CO.

Oakland. Calif.

Alki, hull No. 4, fireboat for City of Seattle; 123 L.O.A.; 26 molded beam. 7′ 6″ draft; 14 knots speed; seven 6-cyl. 300-H.P. Winton diesel engs.; **keel July 7/27.**

R. W. Atkinson, hull No. 5, dipper dredge hull for Hawaiian Dredging Co., Honolulu; **launched June 30/27.**

PRINCE RUPERT DRYDOCK AND SHIPYARD

Prince Rupert, B.C.

Bertha G., seine fishing boat for Gammon & Watts; 64ft. long; keel March 1/27; **delivered June 15/27.**

Halibut fishing boat for P. Bruno; 54 ft. long; keel April 1/27; launched May 30/27.

Zapora, halibut boat for Lars Voge; 61ft. long; keel May 1/27.

Fishing boat for Gammon & Watt; 54′ long; keel May 31/27.

Scow for Rupert Marine Products Co., 58x22x4′6″; keel laid.

W. F. STONE & SON

Oakland, Calif.

Purchasing Agent: Lester Stone.

No name, motor cruiser, for stock, 36x10x3½ ft.; 12 mi. speed; 65-HP. gas engines.

Alona, hull 828, yacht for Frank B. Drake; **55 L.B.P.; 13 beam; 6 loaded draft; 7 mi. speed; 30 I.H.P. gas eng.; keel Aug. 25/26 deliver May 1/27 est.**

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY

Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Five sand barges for J. K. Davison & Bro.; 135′x27′x7′6″.

Thirteen barges for Mississippi River Commission, Memphis; 130′x30′x7′6″.

Fifteen covered barges for Inland Waterways Corp., Washington, D.C.; 126′x33′x7′6″.

AMERICAN BROWN-BOVERI ELECTRIC CORP.

Camden, N. J.

Purchasing Agent: L. G. Buckwalter.

Hull 371, carfloat for Pennsylvania R.R. Co.; 185′x34′x9′6″; **keel June /27.**

Hull 372, same as above; **keel June /27.**

THE AMERICAN SHIP BUILDING COMPANY

Cleveland. Ohio.

Purchasing Agent: C H Hirsching.

Carl D. Bradley, hull 797, self-unloading bulk freighter for Bradley Transport. Co.; 615 L.B.P.; 65 beam; 20 loaded draft; 14 mi. speed; 13,000 D.W.T.; turbo-electric drive; 4000 I.H.P.; 2 water tube boilers; 325 lbs. pressure; keel Jan. 10/27; launched Apr. 9/27; deliver July 1/27 est.

Harry Coulby, hull 798, bulk freighter for Pickands, Mather & Co.; 607′ L.B.P.; 65′ beam; 33′ loaded draft; 13 mi. speed; 13,800 D.W.T.; T.E. engs.; 2800 I.H P.; 3 B & W boilers; 200 lbs. pressure; keel Feb. 7/27; launched April 30/27; deliver July 1/27 est.

Not named, hull 799, tug for Michigan Limestone & Chemical Co., 83′6″ L.B.P.; 24 beam; 12 draft; 12 mi. speed; compound engs. 900 I.H.P.; 1 fire tube boiler, 160 lbs. pressure; keel Mar. 1/27 est.; launch Apr. 9/27 est.; deliver May 1/27 est.

Not named, hull 800, bulk oil barge for Standard Transportation Co.; 258 L.B.P.; 40 beam; 10 draft; keel Mar. 21/27 est.; launch July 13/27 est.; deliver July 27/27 est.

Not named, hull 801, oil barge for Standard Transportation Co., sister to above; keel Mar. 21/27 est ; launch July 13/27 est.; deliver July 27/27 est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT

Quincy, Mass.

Lexington, hull 1300, airplane-carrier U.S.N., launched Oct. 3/25.

Hull 1402, carfloat, N.Y., N.H. & Hartford R.R.; 360′x40′x11′6″; 1375 gro. tons; keel July 14/26.

Hull 1403, carfloat, same as above; keel July 15/26.

Hull 1404, carfloat, same as above; keel July 16/26.

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In American Shipyards

Hull 1405, carfloat, same as above; keel July 16/26.

Hull 1406, oil barge for City Service Transport Co. 204'x35'6'x14'3"

COLLINGWOOD SHIPBUILDING CO.,

Collingwood, Ontario.

Purchasing agent. E. Podmore.

Not named, hull 79, sand carrier for Interlake Transportation Co , Ltd., Montreal; 252 L.B.P.; 43'6" beam; 2200 D.W.T. on 14' draft; T.E. engs., 700 I.H.P.- 2 Scotch boilers, 13' diam; **keel Apr. 28/27;** launch July 30/27 est.; deliver Aug. 30/27 est.

CONSOLIDATED SHIPBUILDING CORPORATION

Morris Heights, N. Y.

Hull 2872, cruiser for B. H. Borden; 95 x 16 ft.; 2 Model R Speedway engs., 300 H.P. ea.

Hull 2874, cruiser for Clifford V. Brokaw; 85x 14 ft. 6 in.; 2 Model R. Speedway engs. 300 H. P. each.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.

Philadelphia, Pa.

Purchasing Agent: Ed. C. Geehr.

Malolo, hull 509, express psgr and frt liner, Matson Navigation Co.; 582 LOA; 577 length at water line; 83 ft beam; depth molded to C deck 54 ft.; displacement 22,050 tons; 8250 DWT; speed 22 knots regular, 23 knots maximum; 25,-000 shaft horsepower; Cramp-Parsons turbines; oil burning B & W water-tube boilers; keel May 4/25; launched June 26/26.

Yarmouth, hull 518, twin screw passenger and freight steamer for Eastern Steamship Lines; 378 length at water line; 55-6 beam; 29-6 molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears, six single-ended Scotch boilers; keel Feb. 23/26; launched Nov. 6/26; deliver July 7/27 est.

Evangeline, hull 524, twin screw passenger and freight steamer for Eastern Steamship Lines; 378 length at water line; 55'6" beam; 29'6" molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears; 6 single-ended Scotch boilers; keel May 1/26; launched Feb. 12/27; deliver Sept. 1/27 est.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

Purchasing Agent: G. O. Williams.

Comoco, hull 122, steel yacht for R. W. Judson, Detroit; 140' L.B.P.; 23'6" beam; 8'9" loaded draft; 15 mi. speed; 260 D.W.T.; 600 I.H.P. diesel engs.; keel Dec. 15/26; launch May 21/27 est.; deliver June 1/27 est.

Helen, hull 121, steel yacht, for Chas. E. Sorensen, Detroit; 105 L B.P.; 17' beam; 6' loaded draft; 13 mi. speed; 110 D.W.T.; 200 I.H.P. diesel engs.; keel Nov. 1/26; launch May 24/27 est.

Grathea II., hull 124, yacht for E. T. Strong, Flint, Mich.; 57'x13'x4'; 13 mi. loaded speed; 22 D.W.T.; 200 I.H.P. gas engs.; keel Aug. 1/27 est.- launch and deliver Apr. 1/28 est.

DRAVO CONTRACTING COMPANY

Pittsburgh, Pa.

Hull 538, steel whirler boat hull for Contracting Dept.; 40x48x5'6"; 100 gro. tons.

Hulls 540-543 inc.; 4 steel barges for Keystone Sand & Supply Co.; 135'x27'x8'; 320 gro. tons ea.

Hulls 577-578, 2 dump scows for Pittsburgh Plate Glass Co.; 110x26x8 ft. 6in.; 220 gro. tons. ea.

Hull 579, steam dredge for Ohio River Gravel Co.; 120 x 32 x 6 ft.; 200 gro. tons.

Hull 580, steel hull "A" frame derrick boat for Pittsburgh Plate Glass Co.; 72 x 34 x 5 ft.; 120 gro. tons.

Hulls 583-590 inc., 8 standard steel barges for stock; 100x26x6 ft. 6 in.; 135 gro. tons each.

Hulls 591-600 inc., 10 standard steel barges for stock, 100x26x6ft. 6in.; 135 gross tons each.

Hulls 601-604 inc., 4 steel barges for Keystone Sand & Supply Co.; 135x27x8ft.; 320 gr. tons ea.

Hulls 605-612 inc., 8 steel barges for Keystone Sand & Supply Co.; 135 x 27 x 8ft.; 320 gr. tons each.

Hull 613, steam dredge for stock; 120'x32'x6'; 200 gr tons each.

Hulls 615 and 616, two 120-H.P. stern wheel diesel towboats for stock; 74ft. 2in. x 16 ft. x 4 ft., 320 gro. tons ea.

Hulls 621-626 inc., six covered oil barges, steel decks, for International Petroleum Co., Montreal; 100'x30'x6'6"; 180 gro. tons ea.

Hulls 632-634 inc., three complete maneuver hulls for U S Engineers, Pittsburgh; 93 gro. tons ea.

Hulls 635-644 inc., ten covered steel barges for Inland Waterways Corp., Washington, D.C.; 126x 33x7'6"; 485 gro. tons ea.

Hulls 652-653, two steel deck scows for U. S. Engineer Office, Philadelphia; 102x30x10 ft.; 400 gro. tons ea.

DUBUQUE BOAT & BOILER WORKS

Dubuque, Iowa

Purchasing Agent: A. L. Yehger.

Thorpe, river towboat for Upper Mississippi Barge Line Co. & Inland Waterways Corp.; 132'x35' x3'6"; stern wheel, tandem comp. surface condensing engs.; 15"x30"x78" stroke; keel Oct. 1/26 est.; launch Mar. 1/27 est.; deliver Apr. 1/27 est.

Weber, river towboat, sister to above; keel Oct 1/26 est.; launch Mar. 1/27 est.; deliver Apr. 1/27 est.

Morse, river towboat, sister to above; keel Oct 1/26 est; launch Mar. 1/27 est; deliver Apr. 1/27 est.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY

Kearny, N. J.

Purchasing Agent: R. S Page.

Dixie, hull 89, passenger and freight steamer for Southern Pacific Steamship Lines, Pier 49, North River, New York; 427 L.B.P.; 60 beam; 25'6" loaded draft; 6700 D.W.T.; De Laval steam turbines; 7700 S.H.P.; 4 B. & W. boilers, 21,900 sq. ft. heating surface; 16,000 sq. ft. superheating surface; keel Jan 31/27- launch July 29/27 est

Hull 90, carfloat for Lehigh Valley Railroad 278x 39x10ft.; keel Apr. 18/27.

Hull 91, same as above; keel May 10/27.

Hull 92, same as above; **keel June 6/27.**

Hull 93, carfloat for D. L. & W. Railroad, 278 x39x10ft.; **keel June 20/27.**

Hull 94, same as above.

Hull 95, same as above.

Hulls 96-99 inc., four carfloats for the Pennsylvania Railroad

GREAT LAKES ENGINEERING WORKS

River Rouge, Mich.

Purchasing Agent: Chas. Short.

S. T. Crapo, hull 256, bulk cement freighter for Huron Transportation Co.; 385 L.B.P.; 60 beam; 19 loaded draft ;11 mi. speed; 7200 D.W.T.; T.E. engs.; 1800 I.H.P.; 3 Scotch boilers, 12 ft. 9 in. diam.; keel April 12/27; **launched July 7/27;** deliver Aug 1/27 est

HOWARD SHIPYARDS & DOCK COMPANY

Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hull 1601, hull for Baton Rouge Car Terminal, Baton Rouge, La.; 285'x60'x9'6"; keel Mar. 30/27; **launched July 9/27;** deliver Aug. 1/27 est.

Hull 1605, steel barge for U. S. Army Engineers, St. Louis; 55x16x3ft.; keel May 3/27.

Hull 1606, same as above; keel May 16/27.

Hull 1607, same as above- keel May 16/27

Hull 1608, same as above; keel May 18/27

Hull 1609, same as above; keel May 18/27.

Hull 1610, same as above; keel May 27/27.

Hull 1611, same as above; **keel June 15/27;** launch and deliver July 21/27 est.

Hull 1612, same as above; **keel June 15/27;** launch and deliver July 21/27 est

Hull 1613, same as above; **keel June 15/27;** launch and deliver July 21/27 est

Hull 1614, same as above- **keel June 17/27;** launch and deliver July 21/27 est

Hull 1615, same as above

Hull 1616, same as above

Hull 1617, same as above

Hull 1618, same as above

Hull 1619, same as above

Hull 1620, same as above

Hull 1621, same as above.

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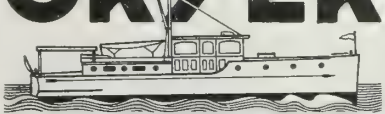

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Hull 1622, same as above.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Purchasing Agent: H. Meyer.

Hull 227, one car ferry for Grand Tiunk Milwaukee Car Ferry Co.; 360′ L.O.A.; 58′ molded beam; 21′6″ depth; 2 T.E. engs.; 4 Scotch boilers; launch Jan. 19/27 est.; deliver Mar. 1/27 est.

MARIETTA MANUFACTURING COMPANY
Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Thirty steel discharge pontoons for U.S. Army Engineers, Rock Island, Ill.; 38′x14′x3′2″; 11 launched.

One steel stern-wheel towboat for Magdalena River, Colombia; 168′ x 42′ x 5′; tandem compound engs.; keel laid; deliver July 1/27 est.

Wharf boat for city of Dubuque, Iowa; 214x45x6ft. 6in.; keel May 11/27.

Wharf boat for Minneapolis; 214x45x6ft. 6in.; keel May 26/27

Wharf boat for St. Paul, 214x45x6ft. 6in ; keel May 30/27.

Stern-wheel towboat for Magdalena River, Colombia: 168′x42′x5′; keel July 15/27 est.

Sternwheel towboat; sister to above; keel Nov. 1/27 est.

Eight steel hoppered cargo barges for Magdalena River, Colombia; 125′x26′x6′

MIDLAND BARGE COMPANY
Midland, Pa.

One dredge hull for River Sand Co.; 131x30x5ft.

Four sectional dry-docks for International Petroleum Co of Montreal; 70x44 ft.

One steel flush deck barge for Dillman Egg Case Co.; 180′x36′x7′.

Fifteen cabin barges for Inland Waterways Corp., Washington, D.C.; 126x33x7′6″; launch first barge Aug 15/27 est.

Five barges for Inland Waterways Corp , 126′x33′x7′6″.

MIDLAND SHIPBUILDING COMPANY, LTD.
Midland, Ontario

Purchasing Agent: R S. McLaughlin

City of Montreal, hull 19, package freighter for Canada Steamships, Ltd ; 230 L.O.A ; 58 beam 23 depth; T.E. engs.; keel Oct. 11/26; launched Jan. 12/27; **delivered June 11/27.**

Saskatoon, hull 20, package freighter for Canada Steamship Lines, Ltd.; 250 L.B.P.; 42 beam; 26ft 6in draft; keel Jan. 18/27; launched June 8/27; deliver July 15/27 est

Weyburn, hull 21, sister to above; keel Jan. 18/27; **launched June 14/27;** deliver Aug 1 27 est

NASHVILLE BRIDGE COMPANY
Nashville, Tenn.

Purchasing Agent: Leo E. Wege.

Hull 108, dredge, McWiluam Dredging Co., clam shell bucket type; 110′x51′6″x8′; steam eng.; **keel July 10/27.**

Hulls 113 to 118 inc., 6 deck barges for stock; **4 delivered.**

Hull 121, deck barge for stock; 140 L.B.P.; 32 beam; 6 loaded draft; keel June 15/27; deliver beam; 6 loaded draft; keel June 15/27 est.; deliver Aug. 1 27 est.

Hull 122, deck barge, same as above; **keel June 15/27.**

Hull 123, deck barge, same as above; **keel June 15/27.**

Hulls 124-127 inc., four deck barges for stock; 130x32x8ft.; keels July 25/27 est.; Aug. 5/27 est.; Aug. 15/27 est.

Hull 128, steel steamboat hull, owner not named; 96 L.B.P.; 24 beam; 4½ loaded draft.

Hull 129, steel deck barge; 100x24x5ft.

Hull 130, same as above.

Hull 131, steel barge, 56x12x2½ ft.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas: Plummer, 233 Broadway New York City.

Shawnee, hull 307, passenger and freight steamship **for Clyde Steamship Company, New York, 407′-3″ overall, 62′-0″ beam, 30′-6″ depth, Newport News turbines and gear; 8500 I.H.P.; Scocth** boilers oil burning; keel May 15/26; launched April 18/27; deliver July/27 est.

California, hull 315, 18-knot, passenger liner **for Panama Pacific Line, New York; 600 ft. long, 80 ft. beam, 52 ft. depth; watertube boilers for oil 22,000 gross tons; 17,000 I.H.P.; keel Mar. 20/26;** launch Oct./27 est.

Caracas, hull 319, passenger and freight steamer for Red D Line, New York; 335′4″ L.O.A.; 51′ beam; 22′ draft; Newport News turbines and gears; water-tube boilers; 3560 D.W.T.; 4000 S.H.P.; keel Nov. 18/26; **launched June 30/27;** deliver Aug. /27 est.

Hull 321, barge for Merritt, Chapman and Scott Corp.; 154x50x13ft.; launch July/27 est.; deliver Aug./27 est.

Not named, hull 323, light cruiser for United States Navy, 10,000 tons displacement.

Not named, hull 324, light cruiser for United States Navy; 10,000 tons displacement.

THE PUSEY AND JONES CORP.
Wilmington, Del.

Purchasing Agent; James Bradford.

Not named, hull 1031, single screw passenger freight steamer for Baltimore & Philadelphia Steamboat Co., Philadelphia; 219 L.B.P.; 45 beam. 11 loaded draft; 14½ mi. speed; 4 crank, TE engs. 21-32-35-35 by 24″; two B & W water-tube boilers, 3046 sq. ft. heating surface each.

Not named, hull 1034, **steel twin-screw diesel yacht from Henry J. Gielow, Inc., naval architect, New York, 294′ L.O.A.; 38′3″ beam; 16′ loaded draft. 2 Bessemer diesel engs.; total of 3000 H.P.; keel Apr. 1/27. launch July 15/27 est.; deliver Jan. 1/28 est.**

STATEN ISLAND SHIPBUILDING COMPANY
Mariner's Harbor, N. Y.

Purchasing agent: R. C. Miller.

Socony 1, hull 774, steam tug for Standard Transportation Co.; 100 ft. 2 in. L. B.P ; **24ft. 1in.** beam: 12ft. 3in. depth; 15 knots speed; comp. engs. 850 I H P.; 1 Scotch boiler 14ft. 9in. dia. by 12ft ; keel Mar. 8/27; **launched June 7/27** deliver July 15/27 est

Socony 5, hull 775, steam tug, sister to above; keel Mar 15/27; launch July 8/27 est.

SUN SHIPBUILDING COMPANY
Chester, Penn.

Purchasing Agent: H. W. Scott.

Not named, hull 104, **single screw bulk oil** steamer for Tidewater Oil Co.; 480′ long; 65′9″ beam, 37 feet depth; to carry 13,000 tons on 27′6″ draft; speed 11½ knots; keel March 1/27; launch Aug. 15/27 est.

Colonial Beacon, hull 105, motor barge for Beacon Oil Co., Boston; 255′6″x40′x15′; two 360 H.P. Fairbanks-Morse diesel engs.; keel laid Mar. 7/27.

Not named, hull 106, motor tanker for Sun Oil Co.; 480′x65′9″x37′; 13,000 D.W.T.; 2800 S. H.P. at 80 R.P.M.; 4 cyl., 2-cycle Sun Doxford engs.; keel May 2/27

Not named, hull 107, tanker for California Petroleum Co.; 510′x70′x40′. 17,000 D.W.T.; 4500 S. H. P. at 82 R.P.M., 8-cyl, 2-cycle Sun-Doxford eng.

Hull 108, carfloat for Pennsylvania Railroad; 330′x38′x10′6″.

Hull 109, same as above.

TOLEDO SHIPBUILDING CO.
Toledo, Ohio.

Purchasing Agent: Otto Hall.

Wabash, hull 177, car ferry for Wabash Ry. Co.; 388 L.B.P.; 57′6″ beam; 16′ loaded draft; 13½ mi. speed; 2500 D.W.T.; T.E. engs.; 2500 I.H.P.; 4 Scotch boilers, 14′6″ diam.; keel Nov. /26; launched Mar. 19/27; **delivered June 25/27.**

B. F. Affleck, freighter, hull 178, for Pittsburgh Steamship Co.; 580 L.B.P.; 60′ beam; 19′ loaded draft; 12½ mi. speed; 12,500 D.W.T.; T.E. engs.; 2500 I H.P.; 3 Scotch boilers; 14′ diam; keel Feb. 1/27; **launched June 25/27;** deliver July 30/27 est.

TODD DRYDOCK & ENGINEERING REPAIR CORP.
Brooklyn, N. Y.

Purchasing Agent: H. J. Shannon.

No name, hull 40, diesel-electric ferryboat for Dept. of Plant & Structures, City of New York; 101 ft. 6 in. length over guards; 27 ft. 7 in. beam; 6 ft. 8¾ in. loaded draft; 300 I.H.P. Nelseco diesel engine; keel Apr. 14/27.

No name, hull 41, diesel-electric ferryboat, sister to above; keel Apr. 14/27.

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Hull 55, steel barge for W. C. Kelly Barge Line; keel Jan. 3/27; launched March 13/27; **delivered Apr. 21/27.**

Hull 58, same as above; keel Apr. 22/27; **launched and delivered June 14/27.**

Hull 59, same as above; **keel May 13/27.**

W. A. Shepard, hull 60, towboat for W. C. Kelly Barge Line; screw propeller, 2 Fairbanks-Morse diesel engs.; 720 B.H.P.; keel Sept. 23/26; launched Jan. 11/27.

Duncan Bruce, hull 61, **stern-wheel towboat, for** W. C. Kelly Barge Line; **135′x35′x6′; Fairbanks-**Morse diesel engs.; keel Jan. 17/27; launched May 2/27.

F. H. Hilliard, hull 62, diesel powered stern wheel survey boat for Mississippi River Comm., Dredging Dist., Memphis Tenn.; 139′6″x24′x5′3″; keel June 2/27.

Repairs

BETHLEHEM SHIPBUILDING CORP., UNION PLANT
Potrero Works, San Francisco

Drydock, paint, misc. repairs: yacht Invader, stmrs. Mahukona, Erik Frisell, Montauk, Manoa, Point Lobos, Hawaiian Standard, W. S. Miller, Montezuma, El Segundo, Lurline, Frank G. Drum, Viosca, W. S. Rheem, Point Sur, McKittrick, U.S.S. Arizona, schr. Forester, boat Hoquiam. Propeller repairs: schr. Tamalpais, stmrs Edgar F. Luckenbach, Maunalei, President McKinley (also new stern tube bushing and ring). Install contrapropeller: Lena Luckenbach. Engine repairs; m.s. Los Alamos, Dilworth, Oran, Tosca. Boiler repairs: Willsolo. Make and install forged steel tail shaft: Florence Olson. Repair anchor, windlass: C. D. Johnson III. Telemotor repairs: stmrs. Mexican, Cities Service Petrol. Misc. repairs: stmrs. Point Judith, West Caddoa, Charles Christenson, Point Arena, Admiral Peoples, Texan, Bolivar, Wm. A. McKenney, West Notus, Iowan, Dilworth, Tahiti, Oran, Maui. Maunalei, Alvarado, Finland, Kentuckian, Panaman, Carlos, Ohioan, Minnesotan, Heffron, Hagood, Yankee Arrow, Emidio, Tamalpais, Montague, Mojave, Satanta, Tamaha, Washtenaw, Lebro, Altair, Esperanze, China Arrow, Inverarder. Shabonee, Sunewco, m.s. Ontariolite, Fordanger, Hamburg, Richlube, Tosca, Cycol, launches Jean, Prospector, tug Woodman, yacht Zahma.

CHARLESTON DRY DOCK AND MACHINERY CO.,
Charleston. S. C.

Purchasing agent: Chas. R. Valk.

Repairs to hull: stmr. Sundance. New stern post and rudder, etc.: stmr. West Comak. General repairs: U.S. dredge Gilmer, U.S. tug Brannan.

COLLINGWOOD SHIPBUILDING CO.,
Collingwood, Ontario.

Purchasing agent: E. Podmore.

Bow damage, repairs, tail shaft drawn, new stern tube, and new crank shaft section, hull painted: stmr. Imperoyal. Bottom damage, repairs: stmr. Drumahoe, Larg (also hull painted), Dalwarnic (new sea cock). Hull caulked: tug H. B. Phillips. Tail shaft drawn, hub refitted, new uptake and smoke stack: stmr. Manitoba. New propellers fitted, tail shafts drawn, bottom painted: stmr. Manitoulin. Tail shaft drawn, stern bearing relined: stmrs. Collingwood, Goodcrich (also bow damage repairs.)

GENERAL ENGINEERING AND DRY DOCK COMPANY,
Alameda, Calif.

Drydock, clean, paint, misc. repairs: m.s. Charles Brower, tug Despatch No. 4, bktn. Makaweli, stmr. R. M. Woodward, General Frank M. Coxe (also general engine and deck repairs), m.s. Associates (engine and deck repairs), ferry Golden West, schr. Metha Nelson, stmr. Port Costa, m.s. Iris A., stmr.

The "putting-on" tool

Do you remember the days of the sky-hook, the left-handed monkey wrench and the putting-on tool? They were grand old shop gags for green hands.

But there *is* a putting-on tool. It is the Oxweld welding blowpipe. It puts on metal where metal is needed. A shaft worn thin can be built up to the proper size. Shear tables and crusher jaws that are ready for the scrap pile can be put back to work by putting on a little metal. And undersized parts can be reclaimed by this modern method.

Nor is that the whole story, for, with welding rods of Haynes Stellite or special alloy steels, the new "put-on" surface can be made better and actually wears longer than the original.

Do you know where the putting-on tool can help you in your business? It pays to be up-to-date.

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DISSOLVED ACETYLENE

Surprise (changed wheels and renewed lead sleeves) General repairs and alterations: stmr. Tashmoo. Recondition, install new engine and new propeller: yacht Four Winds. Engine room repairs: stmr. Chamberlin, Jr. Minor repairs, inclining test: Harry E. Speas. Dock for inspection, pull shaft, minor repairs: ferry San Jose. Jobs listed last month still undergoing repairs: Unimak, Idaho, Phoenix.

U. S. NAVY YARD
Bremerton, Wash.

Drydock, misc. repairs: New Mexico, Reno, Sinclair, McDermut, Kennedy, Mullany. Misc. repairs incidental to operation as district craft: Mahopac, Swallow, Challenge, Pawtucket, Sotoyomo, Tatnuck.

PRINCE RUPERT DRY DOCK AND SHIPYARD.
Prince Rupert, B.C.

Docked, clean, paint, annual overhaul: C. G. M. Birnie, stmr Prince George (two propeller blades changed), three Somerville Cannery Co. scows. Lined for grain loading: stmr. Yomei Maru. Docked, cleaned, painted, misc. hull and engine repairs to 26 fishing boats. Misc. hull and engine repairs to 31 fishing boats not requiring docking. 100 other commercial jobs.

TODD DRY DOCKS, INC.,
Harbor Island, Seattle, Wash.

Drydock, clean, paint, misc. repairs: m.s. Apex, stmr. Capac, Latouche. Collision damage repairs: stmr. Arkansas. Engine repairs: stmr. Drechtdyk, H. F. Alexander. Drydock for survey stmr.: Suremico. Repair steam line: stmr. Surailco. Misc. shaft repairs: stmr. Bearport. Misc. repairs: stmr. Comanche, West Cape, West Montop, ferry Whidby.

VICTORIA MACHINERY DEPOT CO., Ltd., Victoria, B. C.
San Pedro, Calif.

Drydock, clean, paint, hull, engine and deck repairs: stmr. Orion, St. Lawrence, tugs Hopkins, Edna Grace, Della C., C.G.S. Madge. Boiler repairs: stmr. Frazer, tug Superior. Dock, clean, paint: stmr. Princess Maquinna. Make and fit new stock and umbrella: tug Olive M. Dock, clean, paint, engine and tail shaft repairs: fishing boat Trapp. Dock for inspection and repairs: m.s. Challamba.

Shipbuilding News

(Continued from Page 391)

LAUNCHINGS

Two scows by J. C. Johnson's Shipyard, Port Blakely, Wash., June 21 and 24.

R. W. Atkinson, dipper dredge hull for Hawaiian Dredging Co., by Pacific Coast Engineering Co., June 30.

Zapora, halibut boat for Lars Voge, by Prince Rupert Drydock and Shipyard, June 29.

S. T. Crapo, bulk cement freighter for Huron Transportation Co., by Great Lakes Engineering Works, July 7.

Hull for Baton Rouge car terminal by Howard Shipyards and Dock Co., July 9.

Weyburn, package freighter for Canada Steamship Lines, Ltd., by Midland Shipbuilding Co., Ltd., June 14.

Caracas, passenger and freight steamer for Red D. Line by Newport News Shipbuilding and Drydock Co., June 20.

Socony 1, steam tug for Standard Transportation Co., by Staten Island Shipbuilding Co., June 7.

B. F. Affleck, freighter for Pittsburgh Steamship Co., by Toledo Shipbuilding Co., June 25.

DELIVERIES

Mendocino, double-end diesel-electric ferryboat for Northwestern Pacific Railroad by Bethlehem Shipbuilding Corp., June 22.

Golden Shore and Golden Poppy, diesel-electric ferryboats to Golden Gate Ferry Co., by General Engineering and Drydock Co., during June; Santa Rosa, ferryboat , to Northern Pacific Railroad during June.

Sally S. and Doris E., cannery tenders for Sunny Point Packing Co., by J. C. Johnson's ship yard, May 23; also two fish scows to same owner; Ruth May, trolling boat for Mike Mathison, June 13.

Redwood Empire, diesel-electric steel ferryboat to Northwestern Pacific Railroad by the Moore Dry Dock Co., July 15.

Bertha G., fishing boat for Gammon & Watts, by Prince Rupert Dry Dock and Shipyard, June 15.

City of Montreal, package freighter for Canada Steamships, Ltd., by Midland Shipbuilding Co., June 11.

Wabash, car ferry for Wabash Railway Co., by Toledo Shipbuilding Co., June 25.

Two steel barges for W. C. Kelly Barge Line, by the Charles Ward Engineering Works, April 21 and June 14.

REPAIRS

Todd Dry Docks, Inc., Seattle, has a contract from the Norwegian America Line for repairs to the steamship Remus, which grounded on the west coast of South America.

Bids ranging from $120,000 to $150,000 were submitted to the Pacific Steamship Company and Lloyds at Victoria for repairs to the steamship Challamba, which went ashore on White Cliff Island near Prince Rupere the middle of June. The bids were submitted as follows:

Burrard Dry Docks, Inc., $120,000 and 135 days; Yarrows, Ltd., $145,000 and 125 days; Todd Dry Docks, Inc., $146,000 and 68 days; Victoria Machinery Depot Co., Ltd., $149,000 and 135 days; Lake Union Drydocks, $150,00 and 60 days.

Bids have been submitted to Lloyds for decision.

The steamship Suremico of the Transmarine Corporation, damaged in collision with the freighter Arkansas the early part of July, may be sold, as is, due to the fact that the lowest bid for the repair of the vessel is around $90,000. The vessel is now in Puget Sound.

SHIPYARD NOTES

The Wilmington Boat Works, Wilmington, California, recently completed a power cruiser for Lewis Stone of Los Angeles. The craft is named Phantom and cost $50,000. She was designed by Nicholas S. Potter of Los Angeles and embodies the latest developments in eastern yacht design, being built for pleasure and fishing cruises. The Phantom is 60 feet long, the lines of her underbody permitting the single, 175-horsepower Hall-Scott motor, with reduction gears, to drive her at a speed of 12 knots.

The United States District Court for the Eastern District of Virginia has ruled that the Newport News Shipbuilding and Drydock Company is liable for full losses sustained by the liner America when that vessel was damaged by fire in the company's yards while undergoing reconditioning last year. The estimated liability is between $1,000,000 and $2,000,000.

There was a sharp increase in world shipbuilding during the quarter ended June 3, according to the records of return from all maritime countries, contained in Lloyd's Register. Calling attention to this in a statement issued July 16, the Transportation Division of the Department of Commerce points out that the United States has fallen from fourth to fifth place in shipbuilding, with England and Ireland, Germany, Italy and Holland outranking it during that period.

As a result of the various changes during the second quarter of 1927, there have been several shifts in the relative ranking of the various countries. Great Britain and Ireland, with a tonnage of 1,390,388, Germany and Italy with 406,933 and 266,000, still stand first, second and third in the order enumerated; but Holland, with 171,000, which stood sixth at the end of the first quarter, is now fourth. The United States, which was fourth, is now fifth, with 146,846 tons, France, which ranked fifth, is sixth.

It is reported from Seattle that Alexander Peabody, vice-president of the Puget Sound Navigation Company, is negotiating in Chicago for the purchase of a modern passenger steamship to be placed in service on Puget Sound in the Seattle-Victoria run.

The Extra Hazard of Government Ownership

American Shipping Men in Foreign Trade Need Freedom from Government Competition So that They Can Concentrate on Competition with Foreign Nationals

By Captain Robert Dollar

"THE Shipping Board must decide whether it is going to stay in or get out of the shipping business. We can't go on this way, and I am sure the Board knows it and will soon make known its plans in a way that will make all American shipping men breathe easier." Such were Captain Robert Dollar's characteristically plain spoken words on his visit to New York where he has been consulting with shipping men following his attendance at the Fourteenth National Foreign Trade Convention at Detroit.

"We all value the services of the Shipping Board highly," Captain Dollar admitted, "and I doubt but that most of us would do the same in their place. But the time for a new arrangement of things is at hand. American privately owned and operated shipping lines must expand if they are to live; they must take the whole world for their field of operation. They feel the risk of an actual rivalry with the Shipping Board fleet, and they apprehend that that fleet, if enlarged, would make the hazard still greater."

"We know what the differentials are between us and foreign ships, because many of us, like myself, have operated foreign ships. And we know the margin is going to take all our effort to overcome. But if American shippers will give us an even break and if the government will make it plain that it is going to enter upon a policy where, stage by stage, it will progressively withdraw and cease to compete with us, we can give the American people the finest merchant marine in the world."

Captain Dollar was very hopeful of the future for pulverized coal as the ships' fuel that may save shipping men in case of an oil shortage.

"I welcome the activity of the government," he said, "in experimenting with the production and space costs of this new fuel. We have to look far in the future on the sea, and pulverized coal is going to be an important clue to the fuel question."

"Business is fine in the west and full cargoes from the Pacific Coast eastbound are the order of the day," the captain admitted. "But going the other way traffic is slacker, but is picking up. In the world at large, Americans may now be assured that the worst of our troubles are over in China. Even during the revolution we have been gaining trade steadily and we are gaining it now. The only cessation came when the Bolsheviks got control of the South China cities. Now they have been thrown out of every city but Hankow and we are only up against the same civil war question we have been up against for the last twelve years. I think the trade future of China is as great as ever, and American opportunity was never better."

Captain Dollar, one of the founders of the National Foreign Trade Council, attended and spoke at its fourteenth convention in Detroit, and told the 1425 delegates that the indispensable condition of growth for the American merchant marine was for the American business community to get behind it.

While in New York Captain Dollar presided at the annual luncheon given in his honor at India House at which P. A. S. Franklin, president of the International Mercantile Marine, Sir Thomas Lipton, Willis H. Booth, vice-president of the Guaranty Trust Company, Ira A. Campbell, general counsel of the American Steamship Owners' Association, and many other men prominent in the shipping world were present.

"Don't Give Up The Ships"

(Continued from Page 353)

charter its vessels to responsible persons, citizens of the United States, who will agree to establish and maintain such lines upon such terms of payment and other conditions as the Board may deem just and necessary, provides:

> "and if no such citizen can be secured to supply such service by the purchase or charter of vessels on terms satisfactory to the Board, the Board shall operate vessels on such line until the business is developed so that such vessels may be sold on satisfactory terms and the service maintained, **or unless it shall appear within a reasonable time that such line cannot be made self-sustaining.**"

A Business Test

This test, however, ought not to be applied until businesslike effort is made by the Shipping Board to make the services pay. That has not been done, and yet improvement in the services and a reduction of losses has gradually been, and in some instances is now being, accomplished. Once a genuine effort is made to place the services on the most efficient operating basis, and to gain for them the patronage of available trade, then, if a given service can not be made self-sustaining, the question as to whether it shall be continued should be determined **after most** careful inquiry by the Shipping Board in conjunction with the Department of Commerce, and after conference with experienced shipping people, who may be able to discover the weaknesses, if any, in operation, and more particularly after consultation with the business interests served by the line. If the territory from which the line draws its patronage does not produce enough business to support it, or if it does produce it but the American business men are not sufficiently interested to patronize the American line against the foreigners, wherever they can, then it is highly questionable whether the service is to be regarded as so essential to foreign trade as to be continued at the expense of the taxpayers generally.

This question must be solved in a large way. If the government, without capital investment to account for,

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†S.S. Colombia	Sept. 17	Sept. 19	*M.S. City of S.F.	....	Sept. 9
*M.S. City of Panama	Sept. 24	Sept. 26	†S.S. Ecuador	Sept. 24	Oct. 4

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can not win the support of American business sufficient to make the ships in a given service pay operating expenses, how can such a service be justified? The fact that a particular port, or senator, or operator, wants it is not the determining factor.

Let us take a specific case. The Shipping Board sold a service known as the American Palmetto Line, operating six 7500 d.w.t. cargo ships out of South Atlantic ports to Continental Europe. The buyers, local business men, believed the line could be made to pay on a capital investment in the ships of $5.50 per ton, practically no investment as ships go, and certainly far below the capital investment of their British competitors. The line could not meet expenses, and the Shipping Board was forced to take the ships back. The public spirited citizens lost their money. The line is still being operated by the Shipping Board, undoubtedly at a loss. But it is safe to say that no comprehensive study has been made of the territory from which the line draws its business to determine whether there is enough business to support it, and if there is, why American business will not patronize a service which the public has generously provided and maintained at a loss for the benefit of these same business interests. If they refuse to use it, and give their cargoes to foreign lines in preference to the American lines, or if the business is not there, then, after those facts are developed, unless there is a reasonable promise of a changed condition in the near future, I venture the assertion that the service is not to be deemed an essential one, and should be abandoned. And for authority I have the backing of a cardinal principle of the Merchant Marine Act.

Why shouldn't the Shipping Board, with the Department of Commerce, for that Department under Secretary Hoover's leadership is doing wonderful work in trade development, and is peculiarly fitted for it, undertake such an investigation, and ascertain why it is that each of these services now being maintained at a loss, is not paying expenses. We can without being unfair to the Shipping Board, suggest that it ought to be commenced without delay. It can not be done in a day or a month, or by the usual character of Shipping Board investigation. It has got to be a serious study of trade by experts.

Public Partnership Needed

The Shipping Board can find guiding precedent in the splendid work which has been done by the Thirteen Shippers Regional Advisory Boards organized by the American Railway Association. These boards are voluntary public organizations representing a territory of common transportation and business interests. The members of the board include representatives of production, distribution, consumption and finance, and their purpose is to promote economy and transportation welfare in each territory, and to assist the railroads individually and collectively in the settlement of questions of car requirements and service. Each board is organized by community groups with a chairman, vice-chairman, and as many members as necessary to cover adequately the community included in the Board's territory.

The organization of these boards was largely the result of the efforts and farsightedness of Secretary Hoover, and splendid results have been accomplished in railway service and in the economic processes of distribution throughout the country.

Secretary Hoover, in one of his speeches, said:

"Through these boards the public becomes a partner in the business of railroad operation. Their continued successful functioning is the most hopeful element on the railroad horizon."

Why not have a little public partnership in shipping?

If any given port, or section of the country, wants a service maintained, why should not the business interests, as for example chambers of commerce or other commercial organizations, help in this investigation? A regional advisory board, having for its object, first the analysis of the business situation, the determination of the available cargo which could be shipped by the American Line, and the ascertainment of the reason why it does not, and second, the procurement of new business for the line, could render a great public service. This is not suggesting an impossible task. It is simply one requiring proper spirit and work.

I do not fail to recognize that the Shipping Board has advocated the patronage of American ships by American business. The Chairman and other Commissioners have made many sound, hard-headed speeches urging the use of American ships, but the situation requires something more than speeches. It needs intensive study and work.

It is safe to say that such an investigation will disclose at least two things, first, it will demonstrate that the American business man is against the government being in the shipping business, and that the government can never successfully carry it on; and second, that so far as the present trades are concerned, the inability of the government to make operating expenses is due to lack of patronage, not to differentials in operating costs.

Such an investigation is quite certain to reveal the wisdom of abandoning some services because the territory from which they draw cannot support them, and to make it equally clear that other services can be brought close to a paying basis so as to justify their continuance, with the reasonable expectation that they will within a reasonable time pass into private ownership, because they can be made self-sustaining, and that this can be done through the business men of the territory served being brought to the realization that their selfish interests demand their use of American ships.

In other words, the business exists in the territory of many of the services, which, if given to American ships, will make their private ownership a sound business venture. Once the truth of the situation is brought home to American business men they will patronize the American ships, for they are as loyal to the flag and as alive to their own interests as any other class of citizens.

Comprehensive Survey

To accomplish this, however, means a different kind of survey and work than the Shipping Board has yet undertaken.

Such a work should include a comprehensive study of operating costs under private ownership, with two objects in view, first, to find its deficiencies and grounds for improvement, and there are opportunities in this direction, for in many respects American shipping is behind other American industries in its economic operation and development; and second, to ascertain and inform the people of the aid, if any, which must be given by the government to maintain the line, granting that it receives the support of business in the territory which its serves. There is little doubt it will show that present losses of the government can be greatly reduced.

Each service should be placed in the hands of the operating company best qualified by its personnel to operate the line, and having the financial backing of the communities which it serves. If and when these lines show promise of ultimately meeting operating expenses, the Shipping Board could afford to sell them on terms, with the first option of purchase to those who operate the service, by which payment of the purchase price would be deferred for a period of years sufficient to test the ability of the line to pay. Meanwhile, the net earnings of the operating company could be impounded and applied to the purchase price of the ships and, if the purchase was not completed, retained by the Board and credited to a replacement fund for that particular service.

It has been suggested by excellent authority that the lines should be sold on bids for the lowest amount of government aid required.

In this way only can the real value of each service to the country's foreign trade, and as a commercial business, be ascertained, and the foundation laid for a permanent and successful merchant marine. Some of the services will have to be abandoned under such a test. But why shouldn't they? Unless there are special reasons, why should the people of the country support a service that its own business community will not back?

The survey suggested is the kind which would be made by prudent business men before venturing upon a large and involved enterprise.

Shipping Board Investigation?

It is true that last year the Shipping Board made a so-called investigation over the country. They divided the country into sections, then rushed from one section to the other, holding hearings, listening to speeches, making speeches, receiving all sorts of suggestions! With what result? Nothing, absolutely nothing of value, so far as has been disclosed to the public, by which these unsold services can be transferred to private ownership and their development fostered.

As a result of these hearings, the Board made a report to Congress which was largely an argument for continued government ownership and operation. It contained no suggestions of practicable value for the establishment of a privately owned merchant marine. On this phase of the question substantially all that was said was:

"This Board is convinced that without additional legislation for direct or indirect federal aid, commonly called a subsidy, a privately owned and operated American merchant marine for our foreign commerce cannot be successful established."

It contained no facts which would show the cost to the American government of supporting a privately owned merchant marine, as against the costs of continuing the experiment of government owned and operated services.

Business vs. Government Operation

The hearings, however, accomplished one thing, and that was to make plain that the business men of America, from Atlantic to Pacific and from the Lakes to the Gulf, are against government ownership and operation.

But despite this knowledge, no one thing has been done since the hearing to advance the day when the government will get out of the shipping business. On the contrary, the Shipping Board gives every indication of defying public opinion, and running counter to the view recently expressed by the President:

"Under our standard we do not expect the government to support trade; we expect trade to support the government. An emergency or national defense may require some different treatment, but under normal conditions, trade should rely on its own resources, and should therefore belong to the province of private enterprise."

The Board seems to be planning, whether consciously or not, to involve the government in permanent ownership, for there are good reasons for believing that the Board is engaged upon plans for the construction of a large number of large and costly diesel engined ships, with which to replace steam propelled vessels in the unsold services now being operated by the government. Some of these ships will necessarily become competitors of services already sold to private interests, and to that extent will lessen the chances of permanent success on the part of those citizens who have ventured their capital in an endeavor to build up a privately owned merchant service.

Due to the high cost of construction in American yards, these vessels will cost approximately a million and a half dollars each, a price so high that their purchase by private capital at cost would be utterly impossible, for the increased efficiency of this type of ship over the ships now in service, would not be sufficient to offset the increased cost resulting from the larger capital investment. Unless provision is made by which these costly vessels can pass into private ownership, at prices less than the cost of construction, just as the Shipping Board has been doing with its steam vessels on all the services heretofore sold, it is an absolute certainty that the government will be intrenched in permanent government ownership and operation. What other possible outcome is there? Absolutely none.

Shipping Interests Alarmed

When the situation which will be created by the construction of these ships, without provision being made whereby they can be transferred to private ownership, on a basis which will make their operation successful, is understood as well as the attitude of some of the Commissioners of the Shipping Board and particularly that of the President of the Fleet Corporation, as evidenced by his recent public remarks, there is little wonder that the shipping interests of America are alarmed at the spectre of permanent government ownership and operation which is coming up on the governmental horizon.

This change in attitude on the part of the Shipping Board came during the last session of Congress, when a few "Government Ownership" senators, not noted for conservatism, indicated that they favored the government discontinuing the sale of ships and services and undertaking their direct operation. Despite the fact that this was not an expression of opinion by the Congress as a whole, after thorough understanding of the existing conditions in shipping and especially in the unsold services, the Board and particularly the President of the Fleet Corporation, seems to have regarded the attitude of these few senators as an edict of the people, and ever since nearly every move has indicated a well defined plan for launching upon a new construction program involving many, many millions of dollars, with no possible basis for the sale of the ship to private owners. Not only that, but the Board has closed down on its former sales policies and is gathering its ships into a great reserved fleet. With hundreds of ships on hand, they have halted in their former sales program. In the light of these conditions, how can there be any question of the end to which American shipping is fast drifting?

War Department Operation

It is not altogether surprising that the President of the Fleet Corporation, a distinguished retired army officer, inexperienced in shipping, should look with favor upon the government entering more deeply into shipping, because that seems to be a part of the atmosphere of the War Department. Despite every effort, the shipping interests have not been able to get the War Department to abandon its operation of army transports for the patronage of privately owned steamships, hereby giving them sustaining help. This, the Navy has done.

Nor has it been possible to bring about a discontinuance of the government line operated by the Panama Railroad Steamship Company, a War Department enterprise, to the Canal.

Notwithstanding that the government operated ships to the Canal were originally placed in service as part of the Canal construction operations, for they were then used to carry men and supplies, they have continued in service ever since. Today they are operating in competition with privately owned American ships, and are literally taking away cargo from those ships which is badly needed to make the private lines self-sustaining.

They are not alone drawing their cargoes from the Canal Zone, but through feeder and transshipment services are reaching Central and South American countries, in the very trade zones of private lines. And what is still worse, approximately 70 per cent of the trade last year was carried in chartered vessels.

In short, the War Department is actually engaged in a foreign shipping business, using chartered vessels in competition with private American citizens who are striving to make their own service self-sustaining.

Alaska Threat

Again, the Alaska Railway Commission is seeking to engage in shipping between Pacific Coast ports and the territory of Alaska. An appropriation for this purpose was included in the last Appropriation Bill, and this despite the fact that Alaska has two splendid privately owned services, and that the railroad operated service could not be made to pay.

Also the Shipping Board is operating ships out of the Gulf to South America, and from Atlantic Coast ports to Australia, and to Atlantic Coast ports from India, in competition with privately owned ships operated by the Munson Line and the U. S. & A., and Isthmian Lines.

In the face of all this, private shipping interests are deeply concerned lest these efforts spell the doom of privately owned shipping.

How can you expect an American citizen who has his money invested in American ships to look to the future with confidence or enthusiasm, when he sees the American government, with all of its vast resources, which is not required to count the cost of operation, actually engaged in a business which in many of the services is bound to be competitive with the private interests?

The Shipping Board may try to explain that these proposed new ships will not be placed in competition with the privately owned vessels. A fleet of 15-knot diesel engine ships, sailing direct from New York to Buenos Aires, or from New York to the Orient, will necessarily be competitors with the slightly higher speed combination passenger and cargo ships purchased by the Munson and Dollar interests, and now operating to those respective countries.

Government Operation Disastrous

Such a program, however, should be deferred until after the character of survey suggested, or similar investigation, has been made, and until it can thereby be determined which of the services stand the test of essentiality. Then, and only then, should any program for new construction be taken up with the business interest concerned in the maintenance of each particular service, and such program should be worked out on a basis with these interests by which the passing of the ships into private ownership can be made a fair business certainty. Any general plan of new construction such as in the making today, without the government first stopping and taking stock of the situation, means permanent government ownership, and the end of private operation, for the shipping business cannot be carried on half privately, and half government owned.

Not only will it mean the end of private shipping in foreign trade, but it will spell disaster, so far as the government's efforts are concerned.

This is particularly true of shipping. Such an enterprise on the part of the government cannot be crowned with success, for the moment word goes out to the commercial world that the American government, with all of its vast resources, is going to become the permanent competitor of the private citizens of other nations engaged in world trade, that moment will the government, have against it every other government and every citizen of every country. And why not? Such attitude is necessarily one of self-defense, because no private citizen of any country can stand against the crushing power of the American Government.

The promise that such power would not so used would avail little for there would still be the lurking fear of their commercial ruination.

It is because permanent government ownership and operation means the end of America's commercial aspirations on the seas, that American shipping interests are aroused.

Summing Up

The first step in a constructive program is to ascertain the facts regarding these unsold services. It can be done by the Shipping Board and the Department of Commerce, and it should be done by them. The initiative will have to come through the Shipping Board, because the ships and services are within its control. If the board will but see the light, and give up for the time being its dream of entering upon a large new shipbuilding program, which will involve the expenditure of over a hundred million dollars, it can do a work that will justify its existence, and win the commendation of every citizen. Such a business survey as outlined will not only result in the disclosure of the facts pertaining to each particular service, viewed as a commercial business proposition, but will necessarily lead to increased patronage of American ships by American business, thus reducing the losses now being met out of the public treasury.

Furthermore, the same plan should be applied by the Shipping Board to the encouragement of new business for the services already sold. If these ships can be kept full of cargo in both directions, certainly income can be increased, and the losses now being taken, and the aid required of the government, can be reduced. It would not be at all surprising if these governmental agencies applied themselves to the task and aroused the latent interest which can easily be created by organized effort, that the differential between present failure and future success will be reduced to a minimum, if not entirely wiped out.

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Who's Who afloat and ashore

Edited by Jerry Scanlon

E. D. Tenney, recently appointed Chairman of the Board of Directors of the Matson Navigation Company, one of the largest steamship companies under the American flag. Mr. Tenney started life as a poor boy working on a Hawaiian plantation.

CAPTAIN JOHN T. DIGGS, who was assigned as master of the liner Maui of the Matson fleet, is the proud possessor of a fine wrist watch. The timepiece was presented to the genial skipper by fellow officers and members of the crew of the liner Matsonia when President William P. Roth promoted Captain Diggs from the Matsonia to the Maui.

Captain Diggs succeeded Commodore Peter Johnson, who is now master of the flagship Malolo.

Captain Diggs had the honor of bringing Lieutenant Maitland and Lieutenant Hegenberger, Hawaiian flight heroes, back to San Francisco on the Maui.

William Sykes, chief engineer of the Panama Mail liner Colombia, is back on the job after two months' vacation due to illness. During his shore-side stay, the engine room was in charge of Chief Engineer Charles Kuhn. Chief Kuhn was formerly aboard the Corinto, and his berth on this vessel was filled by Ulysses Grant Rowley, veteran of the Panama Mail.

Chief Kuhn has returned to his old position with the General Engineering and Drydock Company.

The time-old tradition of the sea that a captain shall never give up the ship was exemplified by Captain John Parry, master of the Leyland Line freighter Huronian, six times decorated for bravery at sea.

The story, which has never been printed before, became known with the arrival here of Chief Officer George W. Richardson, of the Panama-Pacific liner Manchuria, a friend of Captain Parry.

Captain Parry was going from his cabin to the bridge at night when he slipped and fell, dropping nine feet. Captain Parry was rendered unconscious. His plight was discovered by the third officer. Removed to his cabin, an examination by a young medical student aboard revealed that the captain had suffered ten broken ribs, and his collar-bone as well as head injuries.

Despite his precarious condition, Captain Parry refused to heed the request of Chief Officer George Bonfield that the vessel put back to Queenstown. He directed the course of the vessel each day from his berth, and despite the accident the vessel reached Montreal on schedule.

A doctor met the vessel and Captain Parry was ordered ashore for treatment. He was transferred to the liner Doric, and is now at his home outside of London recuperating.

Captain Parry, 72 years old, is a veteran of the I.M.M. fleet, and is well-known on the Pacific as well as the Atlantic Ocean.

Word reached the writer that Captain William M. Smith, retired, formerly port captain in New York for the International Mercantile Marine, is now visiting on the East Coast, and plans to come to California for a visit this month.

Captain Smith sailed the Pacific Ocean for nine years as master of various I. M. M. vessels. He retired from the sea in 1919, when he held the position as New York port captain. He was succeeded by Captain James Thompson, who has been port captain for the past eight years.

Edward Mason, who was forced to relinquish his position as chief officer aboard the liner Sierra, due to illness, has fully recovered and now holds the same officership aboard the Matson freighter Manukai, one of the largest cargo carriers in the company's service. He is the son of Captain Edward Mason, bar pilot, and young Mason is one of the most popular of the officers in the Matson fleet.

Eddie Jr. had his tonsils removed, and he stated that he would rather do a 48 hour watch than repeat the operation. He is now fully recovered and reports an additional ten pounds in weight.

Of interest to all passenger officials is the news from Europe of the promotion of Major E. Trevor Lewis as assistant manager of the White Star Line at Southampton. He succeeds H. Winchester Sanderson, who also received promotion to the position of chief assistant general manager at Liverpool.

Major Lewis served for years in Egypt for the White Star, and is known to thousands of travelers from all parts of the world.

Chief Engineer M. E. Gaviglio, of the West Cajoot, is expected back on the freighter West Cajoot, after remaining shoreside for two trips. His place during his absence is being filled by Paul F. Blinn.

Vance L. Mills, who was recently assigned from the carrier Manulani to the liner Sonoma, states that he likes the extended run to the South Seas and Australia. Mills was succeeded on the Manulani by Leo. H. Dashley, formerly second assistant.

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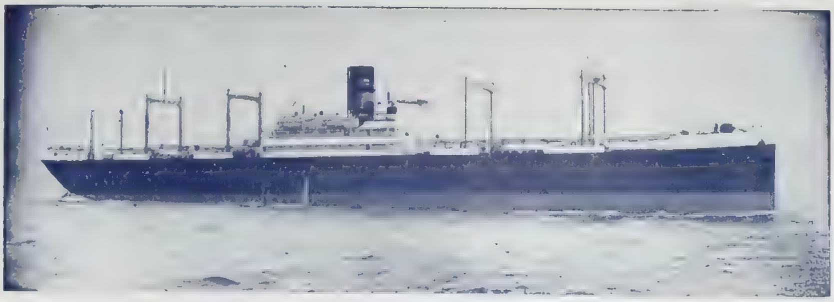

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The engine room of the Nelson Company's lumber carrier Cadaretta is now in charge of Chief Engineer Fred A. Buckley, one of the most popular coastwise engineers sailing the Pacific.

In recognition of faithful service, Chief Engineer David LeVake elevated Peter Ramm as first assistant and W. R. Campbell as second assistant of the freighter Bearport.

James King Steele, publisher of "Japan" and public relations manager for the Nippon Yusen Kaisha, has returned from a trip that carried him virtually around the world. Mr. Steele was absent for five months. He reported general steamship conditions healthy in all maritime countries that he visited.

Announcement was made late last month by H. C. Cantelow of his establishment of a steamship agency in San Francisco. He stated that he will be assisted by his son, E. M. Cantelow.

Mr. Cantelow resigned several months ago as vice-president of the Luckenbach Steamship Company. He is one of the best known maritime executives on the Pacific Coast. Mr. Cantelow, before joining the Luckenbach Line, was Puget Sound manager for the Pacific Steamship Company.

The Mitsubishi Dockyard Company of Nagasaki has been awarded the contract for the construction of two of the three new motor liners for the Nippon Yusen Kaisha, according to advices received by Takeo Yamamoto, San Francisco manager.

The first of the two vessels will be completed and ready for service in September of 1929. The vessels will operate in the California Orient trade. The second liner is scheduled for delivery in March of 1930.

Plans for building the third liner have been temporarily held up. The Kawasaki Shipyards were expected to get this contract, but there was a change in the plans and final decision will not be made for some time.

The report stated that the specifications have been altered to permit the accommodation of 837 passengers instead of 700 as originally planned on the three vessels. They will have space for 6000 tons of cargo, plus 300 tons of refrigerator space.

Sent from Washington by T. V. O'Connor, chairman of the board, D. S. Morrison and J. C. Jendron visited the Pacific Coast this month to inspect vessels and terminals utilized by the United States Shipping Board. The executives were reported to have been assigned the task of making a complete survey of vessels operated by private companies that have been listed in the general program for disposal.

George Dow, second officer aboard the liner Colombia of the Panama Mail intercoastal fleet, is taking a well-earned vacation. He will return to his berth the end of this month.

Purchase of the steamer Oregon, which has been operated on a charter basis by the Williams Line, has been completed and the vessel has been renamed the Willbaco. The securing of the Willbaco brings the Company's fleet, maintaining the coast to coast service, up to eight cargo carriers.

Donald McLean, left, recently appointed manager of Castle & Cook, Honolulu, chatting with Chief Engineer E. J. Mooney of the Matsonia. Mr. McLean was formerly purser on the Matsonia.

A new "watchman" will patrol the white wastes of the Arctic waters next spring, replacing the valiant old cutter Bear. The vessel is the Northland, and is now moored at Oakland.

The Northland is the first Diesel electric cutter built for the Coast Guard, and is a product of the Newport News Shipbuilding Company. The craft is commended by Captain J. L. Hottel.

The Northland was designed for a speed of twelve knots. The power plant consists of two main General Electric generators, two auxiliary generators mounted on shaft extensions of the main generators, and three independently driven auxiliary generators. All are driven by Diesel oil engines. The generators in turn supply the necessary electricity to drive the propelling motors and the electrically operated auxiliaries, such as anchor windlass, ventilating fans, machine shop tools, circulating pumps, fire pumps, fresh water pumps, fuel transfer pumps, fuel tank heater pumps, auxiliary air compressor, refrigerating equipment, boiler feed pump, fuel and lubricating oil separators, and electro-hydraulic steering apparatus.

These are driven by a total of twenty-two motors, having an aggregate of 189 horsepower.

Practically all of the electrical equipment is of General Electric Company manufacture. A complete description with pictures appeared in the July issue of the Pacific Marine Review.

The Luckenbach and American-Hawaiian Steamship companies have entered into a joint agreement for the use of the Howard Terminals and Lawrence Terminals in Oakland. The agreement for the exchange of terminal service by the two companies went into effect July 15, and was worked out for the convenience of handling freight.

A joint statement was to the effect that the extraordinary development of the port of Oakland in the recent past has been due, to a large extent, to the various steamship companies serving the port and the terminal operators working together in close harmony.

The North German Lloyd will open their own offices on the Pacific Coast, and the first headquarters will be established in San Francisco on August 6. These offices will be opened following the decision of the powerful German line to operate under their own house flag in the European-Pacific service.

A tri-weekly service will be maintained. The vessels will be routed out of Hamburg via the Panama Canal, calling at all Pacific Coast ports, including Vancouver, B.C., the report from the home office in Bremen, Germany, announced.

Six vessels will be operated in the service, the report added.

An application has been presented for an increase in the wages of marine engineers employed on United States Shipping Board boats.

The increase was presented to President Dalton of the Merchant Fleet Corporation by the Ocean Association of Marine Engineers.

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The request covers an increase of $25 per month for all engineers from chief to fourth assistant, and also asks a ten dollar raise for engineers on cargo and passenger vessels.

The petition also asks that a 10 per cent differential be allowed to all engineers on oil tankers of the Fleet Corporation, the same as is allowed by foreign shipowners, over the wages granted on cargo carriers.

No action on the request has been made as yet by the Emergency Fleet Corporation.

Seattle continues to rank first as the silk importing port on the Pacific Coast. For the five months of the present year, ending May 31, the records show the Puget Sound port having received a total of 101,361 bales, with San Francisco second for the same period with a total of 54,119 bales imported at a value of $54,119,000.

The Vegetable Oils Product Company has just submitted a request to Harbor Manager F. B. Cole for an increased allotment of land in the inner harbor, approximating two and one-half acres to handle the company's increased business at Los Angeles harbor.

Chief Engineer Merle Johnson of the Panama Mail liner Ecuador is expected to take a shore-side position with the Company when he arrives here early this month. Chief Johnson is well-known on both the Pacific and Atlantic Coasts, and news that he was slated for promotion was received with satisfaction in the ranks of the engineering fraternity.

Chief Johnson has served on all of the company's vessels with the exception of the motorships.

United States Inspector of Hulls and Boilers Joseph Dolan granted a chief engineer's ticket to Ray V. Nanscowen, following the latter's examination before the inspectors' board.

The tanker Frank G. Drumm's engine room is now in charge of Chief Engineer Harry C. Ruf. Chief Ruf was confined to the Marine Hospital for a few weeks, and when he recovered was given the berth on the tanker.

Major H. A. Finch, Los Angeles district engineer for the United States board of army engineers for the past three years, has been ordered east for a new assignment. He was succeeded by Major George Cross.

Chief Engineer Edwin W. Bence of the Panama-Pacific liner Manchuria. Chief Bence is a veteran of the I.M.M. Company and was formerly on the liners Kroonland and Finland.

The sudden death last month of Captain E. L. Cordin at a San Pedro Hospital was a shock to shipping men along the Pacific Coast.

Captain Cordin was master of the French line freighter Alaska. When his vessel arrived at Los Angeles Harbor, Captain Cordin was stricken with appendicitis, and following an operation passed away within two days.

He was popular with all shipping men, having sailed in and out of the Pacific Coast for many years.

The United States Navy has asked for bids on the gunboat Wolverine, first iron vessel constructed for the Navy. The vessel has been in service on the Great Lakes. The craft was ordered decommissioned last year. The City of Erie, Pa., asked that the craft be turned over to the city. This was complied with by a special Act of Congress, but later, the city refused the vessel.

The Wolverine was commenced in 1842, and constructed in sections at Pittsburg, Pa. She was launched and completed in December 1884 on Lake Erie. She is a vessel of 685 tons, and was considered a first-class vessel of her type in those days.

Under private terms, the motorship Sierra, 743 tons, was sold last month to C. J. Lomen by S. S. Freeman & Company. The vessel has been engaged in the coastwise lumber trade for many years. Four years ago she collided off the Farallone Islands with the liner Wilhelmina, and was towed into port in a waterlogged condition. Repairs were made and she again plied in the lumber trade, until her present sale.

No announcement as to the future services of the Sierra has been made to date by C. J. Lomen.

Michael J. Buckley, freight traffic manager for the Dollar Line, is now actively directing the affairs of the Pacific Westbound Conference, following his election. He succeeded L. L. Bates, whose term expired. Mr. Bates was complimented by the executives of lines represented in the Pacific Westbound Conference for his fine efforts during his tenure of office. E. J. A. Watts was again re-elected secretary of the conference.

Harry Dollar, a nephew of Captain Robert Dollar, and formerly identified with the Dollar lumber interests in Puget Sound, has been given charge of all the Dollar interests in British Columbia. His brother, James Dollar, is in charge of the Company's logging interests in British Columbia.

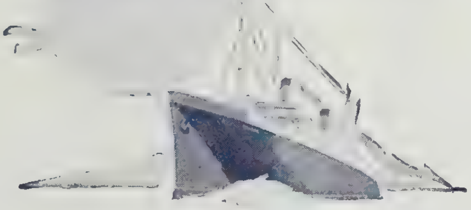
Bearing optimistic reports of general shipping conditions on the East Coast and Gulf, J. R. Fitzgerald, general agent for the American-Hawaiian Steamship Company, is back at his desk after a six weeks visit at Eastern and Gulf ports.

J. H. Dyer, general manager for the Southern Pacific, announced the appointment of C. J. McDonald as manager of perishable freight traffic. Mr. McDonald, well-known to steamship men, has been for many years in charge of this business of the Southern Pacific with the title of superintendent.

News of the death of Chief Engineer Alfred Olson of the steamship Aberdeen in Kodiak last month was received with sadness by a large number of fellow engineers. The brief message received here merely reported his passing. He leaves a widow, who resides in Seattle.

Contract was secured by J. J. Tynan, vice-president and general manager of the Bethlehem Shipbuilding Corporation for the construction of five coast guard cutters for the Government.

go to
hawaii
this October



MAKE your plans now for a wonderful autumn trip. September and October are wonderful months in which to visit the Hawaiian Islands; playground and wonderland of the Pacific. The summer rush of travel is over, insuring your choice of hotel accommodations in Honolulu. Indian summer days of dreamy sunshine, nights of lovely tropic beauty. Swimming, outrigger canoeing, golfing, hiking, motoring over miles of perfect highways—all these await you in new surroundings.

This fall the new MALOLO (Flying Fish), famous new flagship of the Matson fleet, will be in service, cutting the time between San Francisco and Honolulu to four days. Until the Malolo is running, eight splendid ships are at your service—the Maui, Matsonia, Wilhelmina, Manoa, Lurline, Sierra, Sonoma and Ventura, furnishing a sailing every Wednesday from San Francisco and every 42 days from Seattle.

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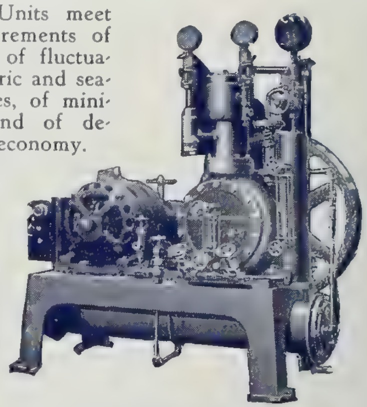

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The vessels, each costing $634,000, will be built at the Fore River Yard, Quincy, Mass. The first three cutters, according to the contract, must be delivered October 31, 1928, and the second two October 31, 1929.

Shipping circles along the Pacific Coast mourned the sudden passing of Mr. Frank M. Stark, who was connected with shipping for more than a quarter of a century. Mr. Stark died at his home, 2215 Eighty-sixth avenue, Oakland, after a short illness. He is survived by his widow. Mr. Stark was at one time an officer aboard vessels of the old Pacific Mail Steamship Company.

OBITUARY

Captain E. S. Randall of the United States Army Transport Service died recently at the Letterman Hospital, San Francisco.

Captain Randall was 62 years old and has been in the transport service continuously since 1898. From 1898 until 1923 Captain Randall was stationed in Manila, where he was master of several interisland transports. In 1923 he came to San Francisco to become master of the U. S. transport Edgemoore, running from New York to San Francisco. Late in 1926, when the Edgemoore was taken over by the Shipping Board, Captain Randall was made master of the Kenowis, which also runs from San Francisco to New York.

On July 22 **Captain Frans L. Kato** died at his home in Alameda after an illness of several months. Captain Kato had served on San Francisco Bay and Sacramento River steamboats for over forty years. His last command was the steamship Pride of the River, owned by the California Transportation Company.

Chief Engineer William Sykes of the Panama Mail liner Ecuador with his 18-months-old daughter Imelda Patricia Sykes. Chief Sykes is now back on the job after two months illness.

On the same date **Captain George L. Hammar** passed away. Captain Hammar was one of the best known skippers in the coastwise lumber fleet.

Pacific Foreign Trade and Travel Exposition

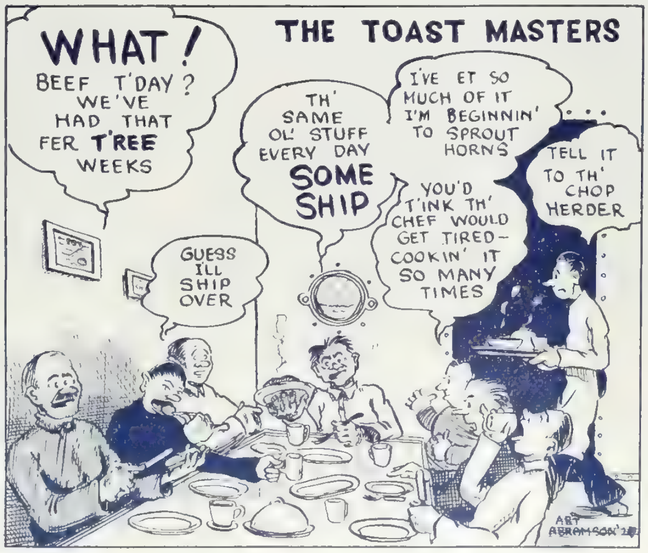
SPECIAL commissioners to various countries of the world have been appointed to extend invitations to manufacturers, tourists, and world traders to attend the Pacific Foreign Trade and Travel Exposition to be held in San Francisco, November 11 to 20 of this year. William D'Egilbert, director general of the exposition, has announced the appointment of this group of commissioners, who are to spread the message of the exposition abroad.

William G. Marvin has been named commissioner to Europe. He is now in Geneva, Switzerland, attending the Economic Conference. Marvin is head of the firm of Marvin & Bergh, international lawyers with offices in all principal cities of the world. He is general manager of the American Manufacturers' Foreign Credit Insurance Exchange.

Abel Santos and Pedro Cezon have been appointed special commissioners to Latin America. Nicholas Berger has been made commissioner to Siberia; Ralph E. Boardman, publisher of Melbourne, commissioner to Australia; E. Nixonwestwood, commissioner to New Zealand and South Sea Islands.

Hugh J. Fleming, former United States Commissioner to the Paris Exposition, has been named special commissioner to the Atlantic States; William Ralston, manufacturer and lumber merchant of Dallas, has been appointed commissioner to Texas; and Dr. Albert C. Carlton, commissioner to Oregon, Washington, and British Columbia. Dr. Carlton is now traveling in the northwest and has interested sixteen chambers of commerce in that territory in the forthcoming Trade and Travel fair, and has also invited participation by the ports of Seattle, Portland, and Bellingham.

In announcing the group of special commissioners, Director General D'Egilbert said, "World-wide attention is being directed to the Pacific Foreign Trade and Travel Exposition to be held in the San Francisco Exposition Auditorium this November. Our special commissioners abroad are in touch with governments, tourist bureaus, important railroad and steamship lines, and with manufacturers and merchants who are consideirng exhibiting at the exposition. The Foreign Trade Club of California, sponsoring the exposition, proposes to make this event an annual affair, and this work which is now being done will mean much in making assured the place of San Francisco as the main center of Pacific trade and travel."


THE TOAST MASTERS
WHAT! BEEF T'DAY? WE'VE HAD THAT FER T'REE WEEKS
TH' SAME OL' STUFF EVERY DAY SOME SHIP
I'VE ET SO MUCH OF IT I'M BEGINNIN' TO SPROUT HORNS ...
TELL IT TO TH' CHOP HERDER
YOU'D T'INK TH' CHEF WOULD GET TIRED—COOKIN' IT SO MANY TIMES
GUESS I'LL SHIP OVER
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GREAT WESTERN RAILWAY

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Freights, Charters, Sales

July 20, 1927.

WHEAT charters, Pacific Coast to United Kingdom and Continent, up to the end of June, were closed at 35/- for August and September loading, but at that time the freights transatlantic and from the Platte broke badly, resulting in tonnage being thrown on this market. A few have been taken at 30/- and many from 31/- to 32/6.

Lumber to Australia, which has been at $14.50 to $15 net through May/June, has now weakened to $13.75, and charterers are not anxious for tonnage.

The liners are able to take care of the East and West Coast of South America.

Lumber to Japan has stood at $10 to $10.25, and the Japanese tonnage has remained in their own coastwise trade, which has been good.

Intercoastal lumber remains at $14 to $14.50.

The following fixtures are reported to the U. K.-Continent: British stmr. Ethelfreda, wheat, 33/9; option Vancouver 32/6; Nov./Dec., Wilmer Grain Co.; British stmr. King Edward, wheat, 32/-, option barley San Francisco 33/9, Aug., Balfour Guthrie & Co.; British stmr. Innerton, wheat, 33/9, Sept., Strauss & Co.; British stmr. Hindustan, barley, 33/9, option wheat 32/6; Aug.-Sept., Edward L. Eyre & Co.; British stmr. Rudby, barley, 33/9, option wheat 32/6; Aug.-Sept., Strauss&Co.; British stmr. Benledi, wheat 35/-; Sept., Heatly & Co.; British stmr. Ainderby, 32/-, Aug., Continental Grain Co.; British stmr. Indian City, grain, 31/3, Aug.-Sept., Kerr Gifford & Co.; British m.s. Oakworth, 32/-, Aug., same charterers; a steamer, wheat, 32/-, Sept., Balfour, Guthrie & Co.; British stmr. Devon City, wheat, 35/-, Sept., Edward L. Eyre & Co.; British stmr. Homer City, same, Aug.; British stmr. Grainton, grain, 31/-, Continental Grain Co.; British stmr. King Cadwallon, wheat, 35/-, Sept., Balfour, Guthrie & Co.; British stmr. Queenmoor, same; British stmr. King Bleddyn, wheat, 30/-, Sept., L. Dreyfus Co.; British stmr. Mabriton, wheat, 31/-, October, Continental Grain Co.; ——Moor, wheat, 32/6; Sept.

The Italian steamer Antonio Tripcovich is reported fixed from Columbia River and San Francisco to Melbourne, lumber, Aug. loading, by J. J. Moore & Co.

The following steamers are reported fixed with lumber to the Orient: Japanese stmr. Ishin Maru, Aug., Canadian-American Shipping Co.; Japanese stmr. Rozan Maru, July, Yamacho Co.; Japanese stmr. Hoyeisan Maru, $10.25, July, W. L. Comyn & Co.; Japanese stmr. Yayoi Maru, July, Nakagawa & Co.; Japanese stmr., July-Aug., Douglas Fir Exploitation & Export Co.; Japanese stmr., July, same charterers; Japanese stmr., August-Sept., same charterers, Japanese steamer Koyu Maru, Aug., same charterers; Japanese stmr. Milan Maru, July, Nakagawa & Co.; Japanese stmr. Yogan Maru, July, Douglas Fir Exploitation & Export Co.; Japanese stmr. Iwatisan Maru, $10.25, Aug., same charterers; Japanese stmr. Taigen Maru, Aug., same charterers.

The following lumber fixtures to the Atlantic are reported: British Stmr. Cape Comorin, July, Canadian American Trading Co.; American ms. Frank Lynch, $15.50, July/Aug.; Norwegian stmr. Tilthorn, $1.10; American stmr. Herman Frasch, $14.50, Aug., A. C. Dutton Lumber Co.; Japanese stmr., $14.25, Aug./Sept., Canadian Transport Co.; Japanese stmr. Tohsei Maru, $14.75, Aug., same charterers.

The Norwegian ms. Belpareil is reported fixed with lumber from the North Pacific to United Kingdom/Continent, Sept. loading, by Canadian American Shipping Co.

The British ms. Levernbank is reported fixed with lumber and general merchandise from San Francisco, Puget Sound, and British Columbia to South Africa, Aug. loading, by J. J. Moore & Co.

The following tanker fixtures are reported: American tanker W. L. Steed, San Francisco to New York, 32½c, clean, June; American tanker Birkinhead, San Francisco to Boston, 84c, clean, June; American tanker Agwisun, San Pedro to New York, 93c, July, fuel oil.

The following miscellaneous fixtures are reported: British stmr. Luciston, Puget Sound and British Columbia to United Kingdom/Continent, lumber and general merchandise, lump sum, July/Aug., Canadian American Shipping Co.; a stmr., Puget Sound to U. K./Continent, two or three ports, lumber and merchandise, Oct., lump sum, £11,000; Norwegian ms. Fernbank, Puget Sound to U. K./Continent, lumber and merchandise, lump sum, Aug., Canadian American Shipping Co.; Norwegian stmr. Knut Jarl, same.

The following time charters are reported: Danish stmr. Dansborg, delivery Gulf, redelivery north of Hatteras, via British Columbia, $1.20, prompt loading; Norwegian stmr. Hampholm, Pacific trade, 7/8 months, delivery Colon, redelivery Australia, $1.25, W. L. Comyn & Co.; Danish ms. Nicoline Maersk, Pacific trade, 4/6 months, North Pacific to Australia, delivery Colon, redelivery North Pacific, $1.75, July, American Trading Co.; Norwegian ms. Nordvard, delivery Baltimore, redelivery north of Hatteras, via British Columbia, prompt, $1.60, Babcock-Angell Lumber Co.; Norwegian ms. Bronnoy, 5 years, $1.50, Canadian Transport Co.; Norwegian ms. Chris Knudsen, 5 years, $1.50, same charterers; British stmr. General Smuts two trips, delivery Japan, redelivery Australia, first trip to West Coast South America, July/Aug., W. L. Comyn & Co.; British stmr. Cragness, North Pacific to Japan, one trip, delivery and redelivery North Pacific, $1.30, Aug., Canadian Transport Co.; British stmr. Norwich City, North Pacific trade, 12 months, $1.15; British stmr. King Robert, one round voyage via North Pacific, delivery Japan, redelivery north of Hatteras, $1.05; Danish stmr. Atlantic, Pacific trade, delivery Singapore, redelivery Japan, 5/6 one trip, 5/3 two trips; Norwegian stmr. Dicto, one round voyage North Pacific, delivery Hampton Roads, $1.12½, July; British stmr. Vestalia, 3/5 months, delivery and redelivery north of Hatteras via British Columbia, prompt loading; British stmr. Orient City, North Pacific to Australia, prompt, Pacific Export Lumber Co.; British stmr. Sheaf Mead, intercoastal, delivery and redelivery Pacific, $1.20, Strange & Co.

The American stmr. Oregon (to be renamed Willbabco) is reported sold by Oregon Steamship Corp. to William S. S. Co., terms private.

PAGE BROTHERS,
Brokers.

Nelseco Double Acting Diesel

(Continued from Page 370)

that the M. A. N. company again took up the construction of other large 2-cycle double-acting engines. Convinced that they could improve on the 1911 effort, they again built a single experimental cylinder and carried on extensive tests in the perfection of details in design and construction. The result of this effort was the placing of an order with M. A. N. from the Hamburg Electric Company for a 15,000 brake horsepower, 2-cycle, double-acting engine. This engine of 9 cylinders is the largest diesel engine in the world and is now operating in Hamburg to the entire satisfaction of its owners.

Simultaneously with this development, M. A. N. began receiving large orders for marine service. Prominent among these is the motorship Augustus built in Italy by Cantieri Officine Savoia. This ship is a passenger liner of the most modern type, equipped with quadruple screws, each propeller being driven by a 7000 shaft horsepower, 2-cycle, double-acting engine. Other orders received by M. A. N. during 1926 included two 5400-horsepower, 7-cylinder, 2-cycle, double-acting engines to be installed in a freighter for the Hamburg-Amerika Line. Also two 5-cylinder engines of the same cylinder size and developing 3750 horsepower for single screw freighters of the same company. The North German Lloyd of Bremen have contracted for a 6-cylinder unit, developing 4600 horsepower, which will be installed in a freight-carrying vessel.

Recent orders received include two large stationary engines, each rated at 11,700 brake horsepower, both of which will be installed in the Maerk Power House. Berlin. Three smaller units, developing 2230 horsepower each, have been contracted for in Russia and will be installed in the Stalingrad Iron Works. The Rotterdam Lloyd of Rotterdam will install in their new passenger ship, the Kota Gede, a 7-cylinder, 5200-brake horsepower, 2-cycle, double-acting engine. The Hamburg-Amerika Line has placed an order with the Vulkan Works for a 17,000-ton freight and passenger ship in which will be installed four M. A. N. double-acting engines. The motorship Braunsfels has recently undergone her trial trip and is now at sea. This ship is equipped with one 4000-brake horsepower, 6-cylinder, 2-cycle, double-acting engine.

The above represents only a partial list of 2-cycle, double-acting engines now under construction by the M. A. N. company and its licensors throughout the world. It illustrates, however, the enthusiastic reception which this design and type has received, both in Europe and this country. Offering, as it does, marked advantages in the reduction of weight and space and also in manufacturing costs of the engine proper, it is evident that this type will greatly appeal to ship owners who are desirous of equipping their vessels with the most modern and economical type of diesel engine for large oceangoing vessels.

British Navy in the Pacific

By Frank C. Bowen.

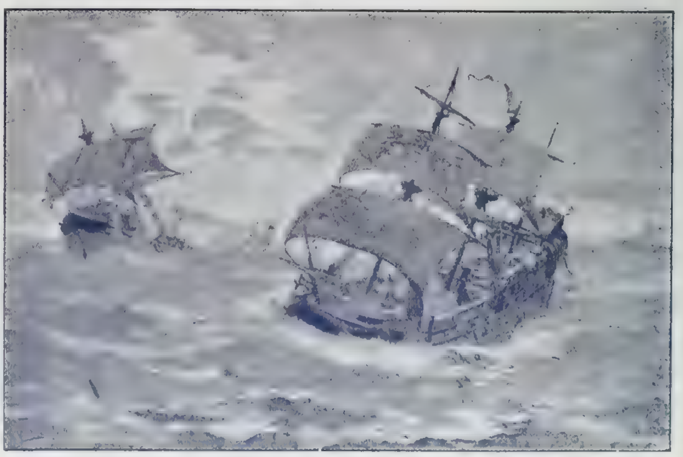
H. M. S. Berwick, built by the Fairfield Company on the Clyde, is the first of the 10,000-ton County cruisers to start her trials, and it is understood that these are to last a long time on account of the somewhat revolutionary features of her design, particularly in the engine room, and the necessity of getting very full experience, both for further ships of the 10,000-ton class and also for the new 8000-ton cruisers of the B class, about whose design there has been infinite speculation.

The design of the County cruisers has not escaped criticism, particularly on the question as to the wisdom of sacrificing a certain amount of speed and only aiming at 31½ knots in order to get protection. Criticism on this point, however, has been largely silenced by the news that the French admiralty has altered the designs of the Suffren and cut down her speed from 33 to 31 knots in order to get added protection.

As soon as they are finished, all these County cruisers are to go out to China, where they will be the backbone of the powerful Eastern fleet, which in the next war will include their sisters in the Australian Navy, the New Zealand Division of rather smaller D class cruisers, and the East Indies squadron. There is no doubt that such a fleet in Oriental waters will meet modern needs excellently, and that they would be quite as effective as attempting to keep capital ships there in peace time.

They will, however, be rather out of the way and as at the moment we have only five cruisers really capable of commerce protection in the most distant seas, there is a good deal of question as to the wisdom of sending them so far. An alternative suggestion that has been put up in Service circles is the formation of a Special Service Squadron, comprising the first five Counties to be completed, which should be at liberty to travel all over the Seven Seas showing the flag, and able to proceed to any point of emergency.

Such a squadron would be ideal for the purpose of training the numerous young seamen in the Navy today, and there is no doubt that its arrival on various stations where there already exists a squadron of smaller cruisers would do wonders to improve their keenness in order to beat the newcomers in gunnery, evolutions, and every competition.



Representatives of another navy that once roamed the Pacific.

Ocean Deeps

(Continued from Page 365)

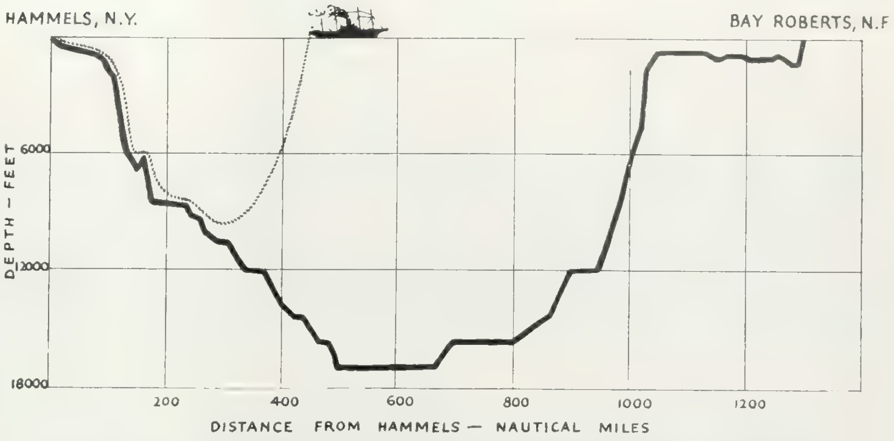
way along the smoothest route, for unless care is exercised the armored strand of copper may be subjected to many dangers. During the laying of the new high speed Permalloy cable in the North Atlantic in 1926, for example, the Western Union cable ship Cyrus Field preceded the cable-laying ship Colonia, taking continuous soundings by means of her sonic depth-finding apparatus, and reporting the readings to the Colonia by wireless.

If the cable is suspended from point to point there is likelihood of its breaking under the strain, or being chafed by the action of currents, and in shallower depths there is the danger of currents, icebergs, ships' anchors, whales, sawfish and swordfish. In warm waters, the tiny teredo or marine borer is a menace against which the only protection for the cable is a sheath of brass.

As a result of thousands of soundings, a pretty accurate picture of the ocean floor has been obtained, and from studies made of thousands of samples of ocean bottom brought up in these soundings and of thousands of hauls from deep sea nets and trawls, a whole fascinating science of the plant and animal life of the ocean has been built up. This includes study of hundreds of species of deep sea fishes and animals of every variety of color, size and stage of development, many of them brought from such depths that they literaly explode from internal pressure when brought to the surface and freed from the tremendous weight of water to which they are accustomed.

The vastly interesting and instructive science of oceanography had its inception in the practice of deep sea soundings, which was given tremendous impetus by the early surveys for cable routes and furthered by the indefatigable work of dozens of cable ships needed for laying and maintaining the network of submarine telegraph lines connecting all the important centers of the world.—Reprinted from Dots and Dashes, June, 1927.

CROSS-SECTION of OCEAN-BED between NEW YORK and NEWFOUNDLAND



THE CABLE LIES IN THE VALLEYS AND ON THE MOUNTAIN TOPS

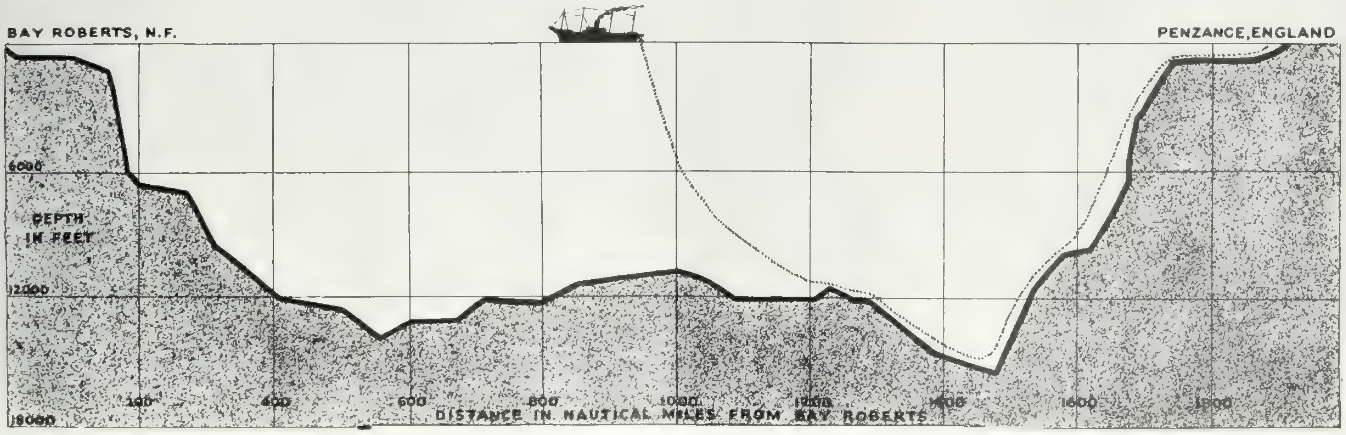
Mobile Radio Beacon

(Continued from Page 369)

At the lower end of the shaft, which extends from the coil above the pilot house roof down through the ceiling to the compass receiver, a pair of sighting wires rotate over a compass card or degree scale as the coil turns. These wires point out the angle between the direction of the incoming signals and either true North or the ship's course, depending upon how it is set, so that it can be read directly without applying correction. An automatic compensator corrects any deflection of the radio waves caused by the ship's hull or rigging.

Calibrating a radio compass for this correction is a highly important part of the instrument's installation, so that the readings may always be true. Several degrees of error caused by disregarded deflection might mean a wreck rather than a safe arrival.

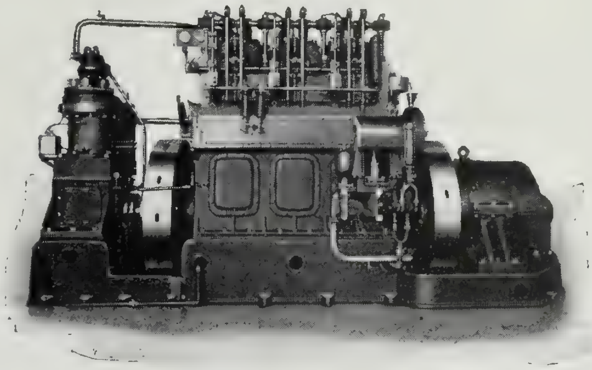
"If not correctly calibrated, a radio compass is a false guide, leading to trouble rather than safety," said Dr. Kolster recently in his laboratory at Palo Alto, where he is chief research engineer for the Federal Telegraph Company of California. "The time must soon come when the government will enforce rigid requirements of radio compass as it now examines life preservers and radio transmitters on ships. The radio compass does not need a skilled operator. Any navigator can use it. But it is a finely adjusted and necessary navigational instrument that must itself shoulder all of the responsibility."



Cross section of ocean floor between Newfoundland and England.

M.S. "Gulfpride" built by the Federal Shipbuilding Company. L. O. A. 543' 11½"; B. 74' 0"; D. (loaded) 28' 0"; cargo capacity of approximately 6,200,000 gallons exclusive of fuel and lubricating oil. Three 150 B.H.P. Nelseco Diesels used for auxiliary purposes.

Nelseco Auxiliary Diesels for America's Largest Motorship



Nelseco Diesel Engine, mechanical injection type, 150 B. H. P. at 260 R. P. M.—Type 3MI-18.

THE largest motorship ever built in this country, the M. S. "Gulfpride", left her builder's yards last March and is now in service of her owners, the Gulf Refining Company.

On board this vessel, a twin screw motor tanker, electricity is used for all auxiliary purposes with the exception of heating. Current for the operation of all the electrical apparatus is provided by three Electro-Dynamic generators, driven by three type 3MI-18 Nelseco Diesel engines.

The Nelseco Diesels are power units of the latest mechanical injection type and develop 150 B. H. P. at 260 R. P. M. Two of the Diesel-generator sets also drive air compressors, each having a capacity of 150 cu. ft. of free air per minute. The other unit is used to develop electricity for power and lighting purposes.

The selection of auxiliary Nelseco Diesels for America's largest motorship is only natural in view of the ruggedness, simplicity and proven efficiency of those dependable power units.

Nelseco engineers will gladly tell you about other interesting installations and will furnish astonishing figures on the low operating cost of Nelseco Diesel Engines. Write for Pamphlet M. N.

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Pacific Marine Review

The National Magazine of Shipping

September, 1927

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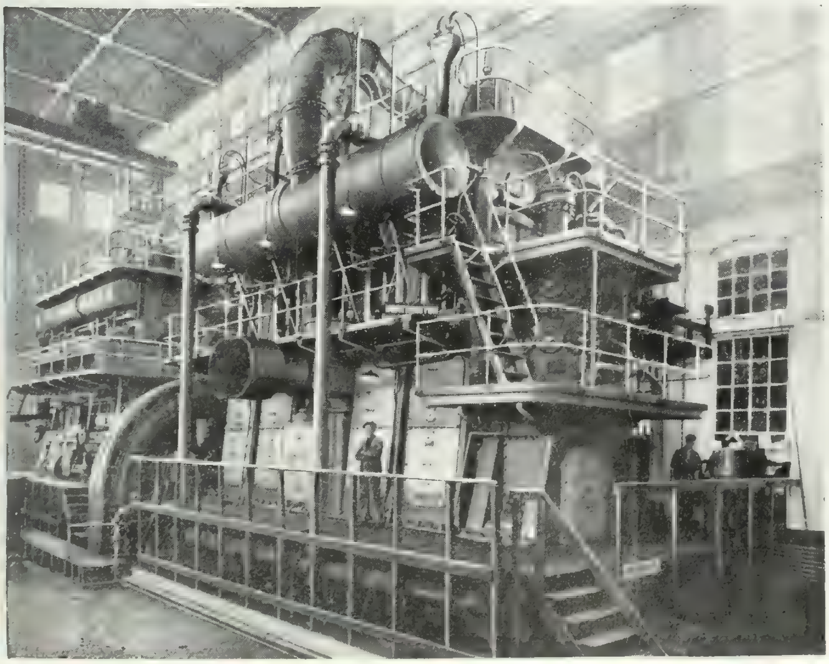

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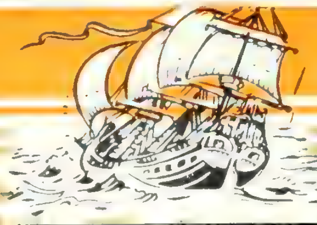

Official Organ
PACIFIC AMERICAN
STEAMSHIP ASSOCIATION

Official Organ
SHIPOWNERS' ASSOCIATION
OF THE PACIFIC COAST

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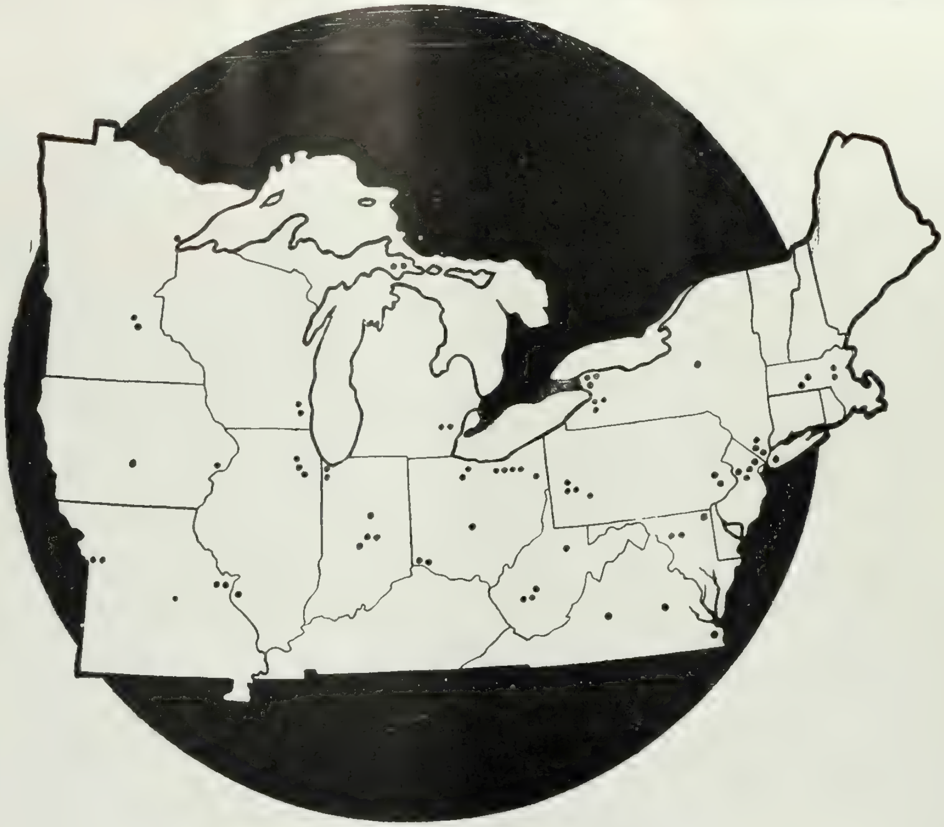

A proving ground for welding

GENERAL MOTORS has built a testing ground for automobiles. Hundreds of miles of roads of all kinds are available and cars are operated until they fall to pieces.

A similar proving ground for oxy-acetylene welding and cutting is operated by Linde in Long Island City, in Buffalo and in ninety-seven other cities throughout the country where plants of the Union Carbide and Carbon Corporation are located.

Exhaustive tests are made on every kind of welding or cutting process, to establish the most economical methods. These methods are then described in detail and published as a "procedure control" or a "welding method."

Such proving grounds give to Linde customers the assurance that they will be kept up-to-date and even ahead-of-date on welding methods. It is a guarantee of good faith that the company is working to develop economy and efficiency in oxy-acetylene applications.

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LINDE OXYGEN

Pacific Marine Review

CONTENTS

September, 1927

Frontispiece ... 11

Editorials ... 397
Ohio River Traffic; Some Developments in Port Engineering; An Engineering Feat; Steamship California.

Pacific Marine Legislation, by Clergue C. Schilling ... 400

What Happened to the Minnesota? ... 401

Captain F. C. Duncan and His Famous Ship Florence, by F. C. Matthews ... 402

Safeby Aboard Tankers, by Vincent Carroll ... 404
Summary of major safety measures taken by the Marine Department of the Standard Oil Company of California.

Highest Powered Naval Vessel ... 406

Soft Soap and Hard Law, by Henry A. Guiler ... 408
A fable dealing with Sherman's Law, Clayton's Act, Mergers, and Emergencies.

The Evolution of Marine Radio, by T. M. Stevens ... 410

Inter-Island Passenger Liner ... 412
Union Plant of the Bethlehem Shipbuilding Corporation building fine passenger steamer for the Inter-Island Steam Navigation Company.

Design of Shipping Terminals for Accommodation of Truck and Rail Traffic, by George F. Nicholson ... 413

The Port of Alexandria, by Roy S. MacElwee ... 416

Sixty Years of Steamboating ... 418

Sumner Willamette Diesel Engine ... 420

St. Francis Yacht Club, San Francisco ... 421

Pacific Workboats and Their Power Plants:

Standardized Express Cruiser ... 422
Victoria Boatyard Notes ... 424
Powerful Diesel Tugboat for Gulf Ports Service ... 425

Auxiliaries, Ship Supplies, Marine Equipment:

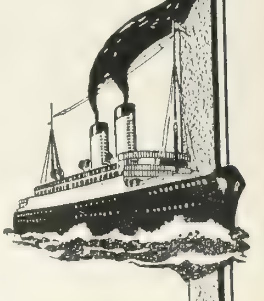
Atomic Hydrogen Welding Now Practicable ... 426
Gyro-Stabilizer for World's Largest Motor Yacht ... 427
Encouragement for Ail Mail ... 427
Portable Crank Pin Turner ... 428
Protection for Ships' Hulls and Power Plants ... 428
Largest Spherical Roller Bearings ... 429
Davis Low Pressure Regulator ... 429
Selection and Care of Wire Rope ... 435

Marine Insurance ... 431

American Shipbuilding ... 439

Of a General Nature:

Editorial Correspondence ... 403
American-Hawaiian Group Insurance ... 403
Williams Line Expansion ... 407
Trade Literature ... 423, 429, 430, 435
Balfour, Guthrie-Jensen & Kessler Consolidate ... 438
H. C. Cantelow & Son ... Adv. Sec. 15
The Alloys Company Agencies ... Adv. Sec. 15
Steam Engineering Merger ... Adv. Sec. 17
McCormick Promotions ... Adv. Sec. 17
Pacific Port Construction Notes ... Adv. Sec. 17
Who's Who Afloat and Ashore ... Adv. Sec. 21
Successful Motorship Trial ... Adv. Sec. 27
Freighters, Charters, Sales ... Adv. Sec. 29
Nonliability Notice ... Adv. Sec. 29



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DEL MONTE

Owned by Manuel H. Freitas.

This vessel is under contract to the California Packing Corporation, packers of DEL MONTE Brand food products.

The Del Monte is of the following dimensions:

Length—88 feet.
Beam—21ft. 6in.
Draft—7ft. 6in.

Her speed is 12½ knots.

She is equipped with a 225 H.P. Direct Reversible UNION Diesel engine.

The boat was built by the Campbell Machine Company, San Diego distributors of UNION Diesel engines.

The "DEL MONTE" has a power driven anchor and cargo winch, a 32 volt lighting system, "Campbell" bait pump and large "live" bait boxes.

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Scene Near Hunters Point, San Francisco

(An etching by John Stoll)

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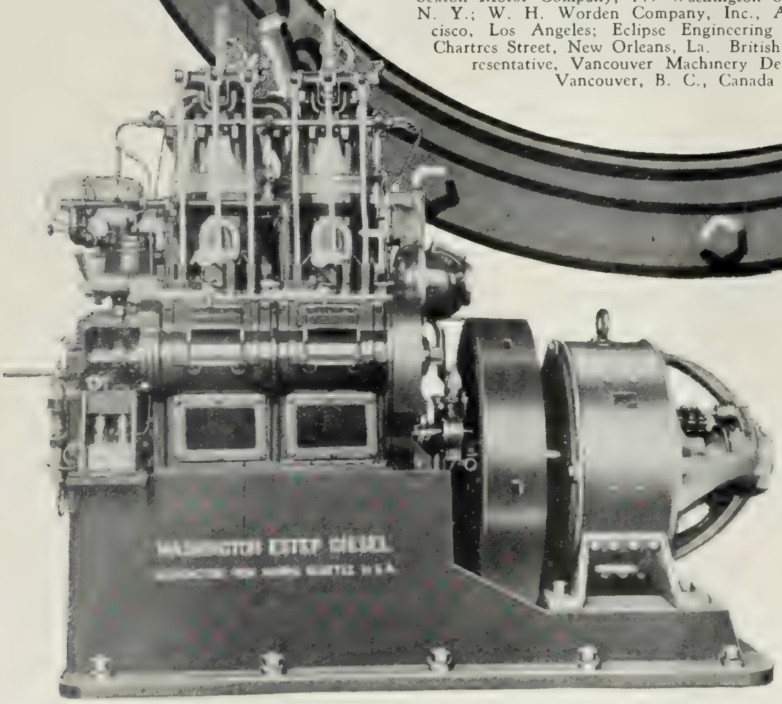

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"WASHINGTON-ESTEP" DIESEL ENGINES

SEPTEMBER, 1927

Vol. XXIV, No. 9

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The National Magazine of Shipping

Official Organ
Pacific American Steamship Association

James S. Hines,
President and Publisher

Bernard N. De Rochie,
Vice-Pres. and Manager.

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Member of Pacific Traffic Association

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Alexander J. Dickie,
Editor.

Paul Faulkner,
Advertising Manager.

Some Developments in Port Engineering

AN encouraging indication of renewed interest in port terminals is found in the fact that this subject is being given prominent place on the programs of meetings of America's engineering organizations. The June issue of "Engineers and Engineering," issued by the Engineers Club of Philadelphia, contains a very interesting symposium of articles including "Need for Modern Port Facilities," by B. Hoff Knight, manager of the port of Philadelphia Ocean Traffic Bureau; "Engineering Side of Pier Construction," by Carroll R. Thompson, chief engineer of the Department of Wharves, Docks, and Ferries of Philadelphia; and "Economics of Engineering in Port Development," by M. A. Long, president of M. A. Long Company, Baltimore.

The first and last of these papers are especially interesting because they present port engineering from the broad economic viewpoint as providing a link in the great transportation system. From this viewpoint both papers are agreed that American ports fall far short of reaching practical operating efficiency in expediting the flow of cargo. Both papers recommend more capital investment in machinery for cargo handling and in warehouse facilities and less capital proportionately in berthing space.

The Materials Handling Division of the American Society of Mechanical Engineers is now preparing a progress report which will cover all the major recent developments and improvements in materials handling machinery and equipment. This naturally covers all terminal work at ports. The Western Division Regional meeting of this society, held at Seattle in August, devoted one technical session to port engineering. The papers presented covered "Dock Cranes," "Cranes for Handling Special Materials at Marine Terminals," and "Conveyor System in a Sugar Warehouse."

A feature of papers and discussions in recent meetings of port authority associations has been the attention devoted to the truck as a factor of rapidly growing importance in the delivery of freight from terminals. In many ports the volume of cargo inbound and outbound delivered or taken from the piers by truck is equal to, or greater than, that coming or going by rail. This fact is facing the designers of new piers and they are making changes in design to adjust loading and unloading to the new conditions. More road space and more opportunity for truck loading at outside platforms without breaking strings of cars on tracks are recognized necessities in pier design, particularly on the Pacific Coast. George F. Nicholson, harbor engineer for Los Angeles, in a paper read before the Pacific Coast Association of Port Authorities, shows that in Los Angeles harbor the present accepted ratio for pier design is 60 per cent of the cargo traffic for motor trucks and 40 per cent for railway cars.

This factor alone may cause a complete revolution in pier design. Nicholson's paper is reproduced in full elsewhere in this issue. Millions are being spent in building paved highway access to waterfronts, so that speedy and economical motor truck transportation is a practicable proposition and the new piers will have to be designed and the old piers altered to give every possible opportunity for free flow of this traffic.

Ohio River Traffic

A STUDY of transportation methods and facilities on the Ohio River system has been completed and a report was issued August 4th. The work has been carried out by the Board of Engineers for Rivers and Harbors of the War Department in cooperation with the Bureau of Operations of the United States Shipping Board.

The Ohio River and its tributaries are now being improved for navigation by numerous projects which have been authorized by Congress. The study reveals rapid advances made during recent years in the volume of tonnage carried on the Ohio River proper and on the entire Ohio River system. For the latter, the record figure of 48,000,000 tons of cargoes was given for the year 1925. This was about 6,000,000 tons greater than the movement during 1920, the previous record year, when the total stood at 42,000,000. On the Ohio River proper some 16,000,000 tons of cargoes were transported during 1925 as compared with 13,000,000 tons in 1905, the previous record.

Coal is by far the most important commodity transported over this river system. Oil and steel products are of growing importance but, according to the report, will scarcely show marked increases until after the completion of the Ohio River project, for much of this traffic will move between Ohio and Mississippi River points over sections not now navigable throughout the year. Pending completion of the improvement, the report declares, it would be premature for steel and oil companies to expend a large amount of capital in terminals and floating equipment which could only be used at short intervals during the year.

The report shows some striking comparisons of the carriage of goods by water over the Ohio River route and by railroad over routes comparable to this water route. In 1923 the commerce on the river was 23,560,000 tons, while the tonnage on the Monongahela Railway was 13,084,000 tons, or a little more than half. The average haul on the river was 42 miles, as against 32 miles on the railway, so that the river's ton-miles of traffic (the total tonnage multiplied by the actual miles carried) was 989,500,000 as against 420,000,000, in round numbers, for the railway.

The conclusion to the report states that the terminals now in existence are adequate for the larger share of the commerce on the river system.

Pacific Foreign Trade Council

TOPICS to be covered at the Fifth Annual Convention of the Pacific Foreign Trade Council indicate that the meeting in Victoria Sept. 15, 16, 17, is to be of very practical value to the business men who attend. Wayne E. Butterbaugh, director of traffic management, La Salle Extension University, Chicago, will discuss "Ways of Regaining, for Pacific Ports, the Traffic Between the Far East and United States that in Recent Years Has Been Diverted to Atlantic Ports." Irving E. Vining, president of the Oregon State Chamber of Commerce, will talk on the "Application of American Statesmanship in Interpreting International Problems."

Other topics, for which speakers will shortly be announced, are "Barriers to Export Trade of the Pacific," "Foreign Credit Insurance," "Protecting the Importer in Customs Matters," "Trading in Wheat Futures," "Developing Foreign Trade Through Travel," "Value of Imports in Developing our Foreign Trade," "Handicaps to Pacific Shipping Interests," "Far East Finance and General Trade Conditions," and "Foreign Markets for Forest Products."

The Trade Advisor Service will be conducted by trade commissioners who have been called in by the United States Department of Commerce from Australia, India, Philippines, China, Japan, Central and South America, and Canada.

Delegates from overseas will include F. A. Paulino, agent general of British Columbia, stationed at London, England; a representative of the Chamber of Commerce of Italy; representatives from the Tokio Chamber of Commerce; Angel Garri, president of the Chamber of Commerce, Santiago, Cuba; Francisco Suris of the Cuba Foodstuff Record, Havana; and an official representative of Mexico.

The Pacific Coast Rivers and Harbors Committee is to hold its annual meeting in Victoria at a time which will permit delegates to attend the sessions of the Pacific Foreign Trade Council. The Canadian Chamber of Commerce, which will hold its annual meeting in Vancouver prior to the Victoria convention, is to join with the Pacific Foreign Trade Council on September 15, the opening day. This will bring about 150 Canadian manufacturers to the sessions in Victoria.

Marine Insurance Lectures

Of interest to those who make an indoor sport of professional education comes the announcement that the University of California, through its Extension Division, will offer a course of ten weekly lectures on marine insurance problems, beginning Wednesday evening, September 14, at 6:20 P.M., in Room 234, Pacific Building, San Francisco. The lectures will be delivered by James A. Quinby, editor of the marine insurance column for the Pacific Marine Review.

An Engineering Feat

FROM a marine engineering viewpoint, one of the most interesting conversions on steamer machinery is that recently completed at the Fairfield Shipbuilding and Engineering Company, Ltd., Glasgow, on the Canadian Pacific Steamship Company's passenger liner Empress of Australia.

The Empress of Australia, formerly the Tirpitz, was built in Germany for the Hamburg-Amerika Line, but was taken over by the British under the Reparations scheme before she had made a commercial voyage under the German flag. She had been fitted with water-tube boilers, turbines, and Fottinger hydraulic transformer gear-driving twin screws. It was found in service that the best results obtainable with this machinery were an average sea speed of 16½ knots and a gross fuel consumption of 205 tons of oil a day. The full power builder's trial with this machinery showed maximum sea speed 17.2 knots. In comparison with similar hulls, these results were very unsatisfactory and J. Johnson, superintendent engineer of the Canadian Pacific Steamships, went very carefully into the whole problem and got out designs and specifications for new machinery to increase speed and save fuel.

The new steam generating installation consists of six double-ended and one single-ended Scotch type marine boilers, oil fired, forced draft, with 220 pounds working pressure and fitted for superheat. These boilers deliver steam to two independent sets of single reduction geared Parsons turbines, each set containing a high pressure, an intermediate pressure, and a low pressure turbine and driving its own propeller shaft through three pinions, each turbine and its pinion being independent. Astern turbines are incorporated in the intermediate and low pressure casings. The ahead turbines generate 20,000 shaft horsepower and the astern 14,000 shaft horsepower. The gear casings were extended downward with a large flat base to distribute strains widely on the tank top and eliminate vibration. A massive cast iron stool was used to support each set of turbines and its condensers.

To suit the new machinery, the line of the propeller shafting had to be altered, the rake being increased two feet 3 inches at the forward end of approximately 150 feet length. New propellers were designed after some experimental laboratory work, and the rotation was reversed so that the screws turn inboard instead of outboard.

The official trial results show a mean speed of 20.345 knots at 20,440 shaft horsepower with a fuel consumption of 0.69 pound of oil per shaft horsepower hour for main and auxiliary machinery, including steering gear, but excluding deck services. This corresponds to 150 tons of fuel per day for all purposes at 19 knots speed in fair weather. Or comparing on an even speed basis, at 16½ knots sea speed, the new machinery would cut the old fuel bill squarely in half and get along on 100 tons a day.

This is a very remarkable showing and illustrates very aptly the progress that can be made along straight steam engineering lines with careful attention to detail. The Empress of Australia is said to be the most economical steam driven vessel in service today, and her steam generating plant works at very moderate pressures and superheats, leaving a considerable margin for additional economies along those lines.

New Intercoastal Liner California

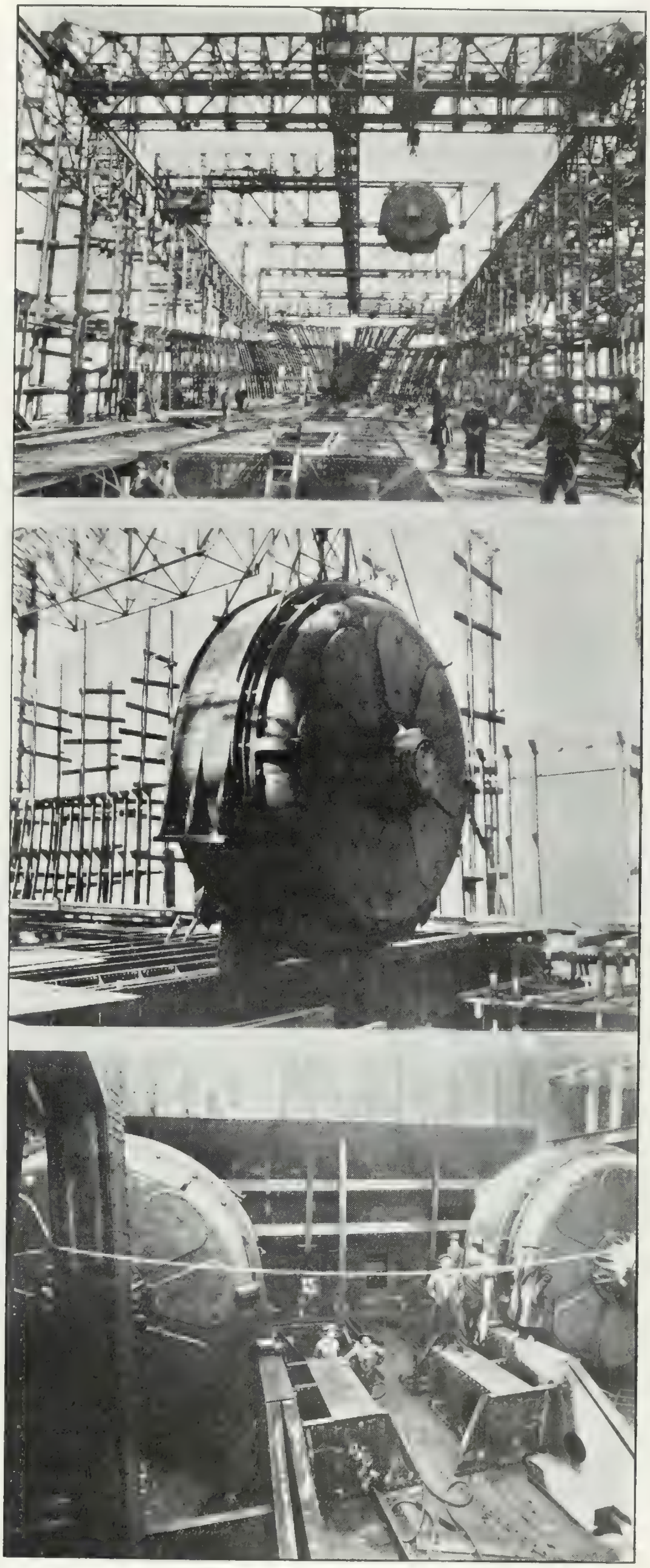
A NEW record in the annals of American shipbuilding will be set with the launching, October 1, of the steamship California, largest commercial steamship to be built under the American flag. This ship, being built by the Newport News Shipbuilding and Drydock Company at Newport News, Virginia, will be used by the Panama Pacific Line, a subsidiary of the International Mercantile Marine Company, in intercoastal trade on a 5500-mile run between New York and San Francisco, via Havana and the Panama Canal.

The California represents the first step in an extensive construction program planned by International Mercantile Marine Company. Contracts have already been let for a second ship, practically identical to the California, which is to be constructed by the same company and in the same yard. In ordering the two ships, the International Mercantile Marine Company has made it known that it has under consideration still another, the three representing an investment of nearly $21,000,000. Plans for the construction of the third vessel have not yet been announced.

The California and her sister ship will both be electrically propelled and as such will be the largest electrically driven passenger vessels in the world. The California will be 601 feet 3 inches long and 80 feet wide, will have a displacement of 31,000 tons, and will be driven through the water at a maximum speed of 18 knots by twin screws directly connected to the shafts of two General Electric synchronous induction motors, each having a normal rating of 6750 shaft horsepower and a maximum continuous rating of 8500 shaft horsepower. Power for driving these motors will be furnished by two General Electric steam turbine generators rated 5250 kilowatts, 2640 revolutions per minute, 3700 volts, 3-phase, and with a maximum continuous rating of 6600 kilowatts, 4000 volts. Steam will be furnished by oil-fired boilers.

When the California takes the water on October 1, she will have been completed as to hull and superstructure to a point where work could be carried no further to advantage on the ways because of her height, which precludes the lifting of weights to her uppermost deck by the traveling cranes that span her berth. As the machinery is all installed, and most of the woodwork, accessories, and fittings are ready for installation, work on the completion of the ship's interior is expected to proceed rapidly, and there is every reason to expect her delivery to her owners next January. After the usual dock trials to make sure that the machinery is in proper working condition, the vessel will be given a progressive trial over the Delaware breakwater course. A six-hour sea trial will then be run at a speed of not less than 18 knots. Anchor gear and steering gear trials will next be held, after which the ship will be dry-docked, and following that will be delivered to the owners at the builder's plant.

At her contract speed of 18 knots, the California could cut the existing voyage time between New York and San Francisco by three days. At sustained voyage speed, and allowing for loss of time from calls at Havana and the Panama Canal, she will cut the existing scheduled voyage time from New York to California ports by two days.



Installing two General Electric synchronous induction motors for propelling the steamship California. Each motor will deliver 8500 shaft horsepower.

Pacific Marine Legislation

By Clergue C. Schilling

DURING the past three years marine interests of the Pacific Coast have been more active in connection with marine legislation in Washington than those of any other section of the country. During that period they have maintained the outstanding legislative bureau at the capital. The reasons for this activity seem obvious. The constant increase in tonnage on the Pacific, both export and import, undoubtedly is the basis of explanation.

Although our actual coast mileage on the Pacific is approximately the same as the coast mileage on the Atlantic, the representation of the Pacific on congressional committees having charge of marine legislation is grossly unequal. This is particularly true in the house, not unmindful of the comparative number of seaports on both coasts or the fact that only three states touch the Pacific while fifteen states touch the coast on the Atlantic.

Unequal Representation

The Commerce Committee of the Senate has three members from the Pacific and eight members from the Atlantic, while in the House the Pacific coast has one representative on the Merchant Marine and Fisheries Committee as against twelve from the Atlantic seaports. This has resulted in placing an onerous burden on the small representation from the Pacific.

Space is not available in an article of this character to undertake an exhaustive discussion of the various bills in Congress which directly or indirectly affect the Pacific trade, but it would seem wise to make a cursory statement as to the outstanding legislation offered in the interests of the Pacific trade in order that a general picture may be given of the legislative situation insofar as this trade is concerned. Two outstanding bills were presented at the last session of Congress by Congressman Arthur M. Free, representative from the eighth district of California, but were unable to be reached in the legislative jam which marked the close of the Sixty-ninth Congress. It is reasonably certain that both of these bills will be reintroduced and taken up for consideration at the next session.

Proposed Amendments

The first measure, H.R. 9399, was introduced on February 16, 1926, and proposes to amend Section Two of the so-called Seamen's Act to permit the master of any vessel in excess of one hundred gross tons to assign, while at sea, a portion of his crew to duty as day men and thus be permitted, while at sea, to utilize the services of his crew in such a manner as the master in his judgment shall consider advisable and essential. At present the law requires the duties of the crew at all times to be confined to their respective article assignments. If this proposed amendment is adopted it will not add to the actual working hours of any member of the crew but a smaller number of men will be able to properly work the vessel and the operating cost will be reduced.

The second measure offered was H.R. 10009, introduced March 4, 1926, which proposed to amend Section 4530 of the Revised Statutes of the United States. Under the present law every seaman on a vessel of the United States is entitled to receive one-half on his unpaid wages earned at every port where the vessel on which he is employed shall load or deliver cargo after the voyage has commenced and before the voyage is ended. No stipulation in a contract between a seaman

Above is pictured the Merchant Marine and Fisheries Committee of the House of Representatives which considered the load-line bills and the Free bills affecting Pacific Coast operators and owners. This committee will be called upon to reconsider these measures at the Seventieth Congress.

Left to right: Harry E. Rowbottom, Indiana; Clay Stone Briggs, Texas; Wallace White, Jr., Maine; Edmund N. Carpenter, Pennsylvania; Frank D. Scott (Chairman), Michigan; Jeremiah O'Connell, Rhode Island; Fletcher Hale, New Hampshire; Arthur M. Free, California; Frederick M. Davenport, New York; Robert L. Bacon, New York; Charles Brand, Ohio; William Johnson, Illinois; Schuyler O. Bland, Virginia; Tom McKeown, Oklahoma; Ladislas Lazaro, Louisiana; Will W. Larsen, Georgia.

Those on the committee not pictured in this group are: F. L. Lehlbach, New Jersey; E. L. Davis, Tennessee; Dan A. Sutherland, Alaska; G. W. Lindsay, New York; F. R. Reid, Illinois; and C. L. Gifford, Massachusetts.

(Note: Representative Lazaro of Louisiana, ranking Democrat on the committee, died shortly after the close of the Sixty-Ninth Congress).

and his employer to the contrary is valid. Such demand shall not be made more than once in five days nor more than once in the same harbor. It is urged that this provision of the law has caused general dissatisfaction and general disorder since its adoption. This is particularly true as to vessels engaged in foreign trade. It is asserted that the experience of these vessels has been that on reaching foreign ports the seamen have demanded one-half of their unpaid wages and have so expended this compensation as to disqualify them for duty because of intoxication, sickness, acquired diseases, or other cause; that in many instances such seamen fail to report at the scheduled time for the ship's departure causing a delayed departure of the vessel and frequently the necessity to depart with an inadequate operating personnel subjecting the ship to a statutory penalty. In addition to the foregoing it is urged that the United States government is also penalized by this provision of law because under Section 4581 and also under Section Nineteen of the Marine Act of 1915 such seamen on the pretext of illness are able to secure the expense of maintenance and return to the United States from a fund required for destitute American seamen.

H.R. 10009 undertakes to at least partially correct the practical injustices by the insertion in the law of the following language:

"Notwithstanding the provisions of this section, the master shall have authority to withhold the payment of wages when, in his judgment, such action is in the interest of safety to the vessel and her cargo or necessary for the preservation of discipline or to avoid delay in the departure of the vessel from such port or place."

If this amendment should be adopted the seaman will still be entitled to one-half of his wages but such payment will undoubtedly be based on past deportment of such seaman, thus permitting the master to again exercise a discretion to insure not only discipline in the crew but a physical condition which will promote the safety of the crew as well as the vessel.

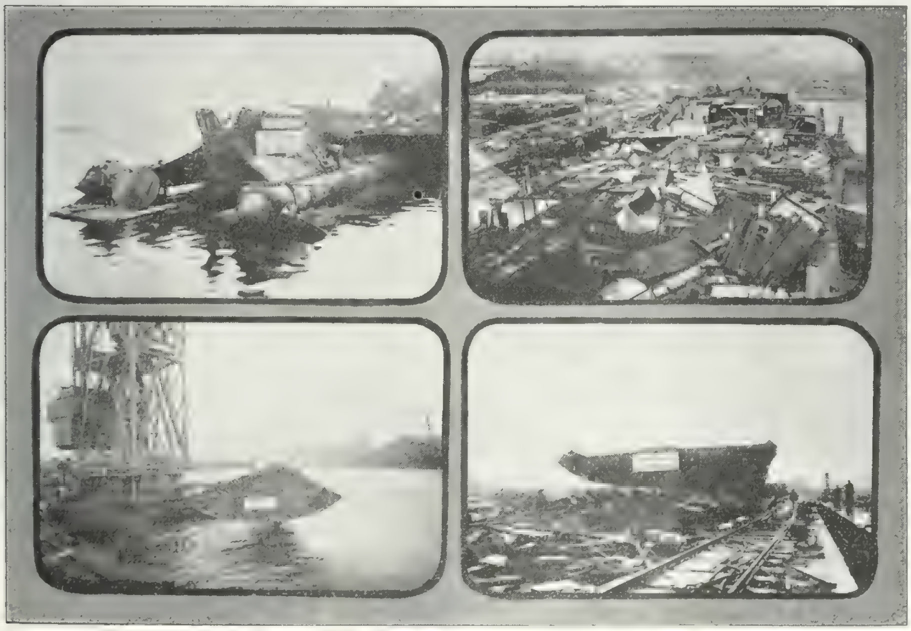
Bitter Opposition Expected

It is already evident that a well organized and bitter fight will be made against both of these amendments, even though the seaman is the one outstanding class of employee in the United States which by law is permitted to draw his wages every five days instead of on the customary semi-monthly or monthly pay day common in other institutions. It might also be noted that no such provision is granted to the employees of the other common carriers. The United States stands almost alone in this character of marine legislation. In the last session of Congress a man competent to judge and authorized to speak for the seamen asserted that the seamen of the United States were distinctly inferior in ability to those of almost every other recognized maritime nation. It is urged by proponents of amendments to the present law that such conditions and lack of discipline on American vessels is due to a false, insidious, and uniformly injurious theory of asserted legislative protection afforded by the present so-called Navigation Laws, many sections of which might properly be labeled as "laws against navigation."

Constant Opposition To Sensible Legislation

It is not a question as to the number of bills introduced but the value of such proposed legislation to the trade. The more benefit such proposed legislation carries to the trade the greater the opposition to its adoption. This is unfortunate but invariably true. To the man on the corner who visualizes the several years' accumulated mass of laws, it would seem easy to obtain legislation, but such is not the fact. The present Seaman's Law, with its desirable and undesirable features, required twenty-five years of persistent effort before it became a law. It required equal time and persistence to secure the adoption of the Coastwise Act, which excludes from this trade all ships of foreign registry.

If the interest of Congress in navigation was as keen and intimate as it is on river and harbor improvement bills the situation would be a most happy one, but it is distinctly easier to comprehend the needs of Mud Creek in the district of Congressman Applesauce than it is to visualize the many requirements of transoceanic trade. We must accept conditions as we find them and not as we might wish them. This is not in any sense offered as a condemnation of Congress, but that the reader may get the actual psychological prospectus of the body, which with its biennial changes, must be educated to the requirements of a trade concerning which the majority has but a vague appreciation.



What Happened to the Minnesota?

Many old timers have wondered just what has happened to the famous old monster Minnesota, the largest American-built freighter. They know that during the war she carried troops and won her chevrons, but after that—What?

To say that in her final throes of death she was hoisted out of the water and tenderly laid on a dock sounds like something that Jules Verne might have written, but that is exactly what happened to her.

She was cut up, afloat in Wilhelmshaven, Germany, in 1924. The cutting started aft, and progressed forward, and the last remnant, her bow, was lifted ashore.

Thus the end of a famous rover of the Pacific.

—C. E. Milbury.

Captain F.C. Duncan and His Famous Ship Florence

By F. C. Matthews

The American ship Florence in a hurricane off Mauritius, from a photograph of a drawing by Captain Duncan, master of the Florence.

SUPPLEMENTING the history of the ship Florence which appeared in the Pacific Marine Review of November, 1926, the following additional particulars of her career, as also incidents in the life of Captain Duncan, will prove of interest, especially to members of the old guard who recall the ship and were so fortunate as to have the friendship of her highly respected master.

Captain Duncan took command of the Florence at New York in January, 1885, and continued in charge until she was sold at San Francisco in October, 1898. The captain celebrated his eightieth birthday on the 23rd of last March at his home in Princeton, Ill., and is still physically and mentally strong. He is one of the few remaining deep-water shipmasters; a gentleman seafarer of the old New England school; a business man as well as navigator; cultured and refined and always awake to the dignity of his calling. This type had become practically nonexistent towards the latter days of his active career. Captain Duncan never used profanity nor would he allow his mates to do so, although, of course, they did break out at times from force of habit. No mate was allowed to strike a man except in self defense and all rebellions against authority were brought to the master to settle. With the crews that were obtainable, particularly in the latter days, force was necessary at times to maintain discipline, but it was always dealt out justly. As to appearance, the captain was always attired as a gentleman passenger might have been and had a pride in his personal appearance that has never left him.

Captain Duncan was accompanied by his wife and family on most of his voyages, and in the cabin of the Florence five children were reared and educated. Fred B. Duncan, a business man of Chicago, from whom many of these details were obtained, first saw the light of day on March 14, 1887, when the ship was tied alongside her wharf at San Francisco. Another son, the youngest of the family, was also born aboard the ship at San Francisco. Due to the careful, painstaking training they received in their home on the Florence, all five children felt no handicap on later taking up their various careers ashore, in which they have met success. One daughter has become a prominent writer of sea fiction.

Captain Duncan made his first voyage as "boy" on the ship St. Helena in 1859. The following year he was in the ship Charles Davenport, and in 1861 an A. B. in the ship Marcia C. Day. The next year saw him third mate of the ship General Burler, an army transport, at New Orleans immediately after the capture of that city in 1862. He then transferred to the ship Charles C. Duncan and later to the ship Cherokee, of which he was third mate when she was sold at Liverpool. Young Duncan then crossed to Portland, Maine, in the steamer Hibernian, and at the age of 17, entered the United States Navy as acting master's mate, being then the youngest commissioned officer in the service. He was in the Brooklyn of Farragut's squadron in the battle of Mobile Bay and was mentioned for gallantry in action. He also served in the Owasco.

At the close of the Civil War young Duncan joined the new ship Kate Davenport of Bath and was in her as chief officer and master for seven years, making voyages to the west coast of Mexico, the guano deposits of Peru, and to the East Indies. Later he gave up the sea and was deputy shipping commissioner for the port of New York. The call of old ocean, however, proved too strong to be stifled and as an opportunity arose in the fine ship Florence, Captain Duncan became her master.

In addition to the various voyages made by the Florence as heretofore narrated, Captain Duncan made two round trips to the East Indies between 1895 and 1897. On the first of these he took case oil from New York to Anjer for orders, making the run in 107 days. Proceeded to Tegal, where a portion of the cargo was discharged, and then to Seourabaya, where unloading was completed. He then went to Manila in ballast and loaded hemp for New York, making the passage from Anjer home in 97 days. At New York a general cargo was laden for Sydney and the passage out was made in 104 days. The vessel loaded coal at Newcastle, and made the run thence to Manila in 40 days, which was reported at the time as the record fast passage; other ships of a large fleet were 70 to 85 days. From Manila the ship took hemp to Philadelphia, her time from Anjer to destination being 91 days. She loaded at Philadelphia for San Francisco and arrived out August 13, 1898, in 132 days. Two months later the ship was sold to parties in San Francisco for $35,000, to be operated in the Pacific, and her new owners gave the command to Captain Ryan.

On May 5, 1893, the Florence left New York in company with the big ship Baring Brothers, both bound for San Francisco. The Shenandoah was loading at the time, and when the Florence was getting away, Captain "Jim" Murphy of the big Sewall ship boasted that he would be at the wharf in San Francisco with a cork fender to assist the Florence in docking. A few days later the New York Sun appeared with an article stating that a bet of $500 was up between the masters of the three ships. The Florence made the run in 130 days, Baring Brothers was 141 days, while Shenandoah's time was 152 days. When Captain Murphy reached San Francisco and found himself beaten by both rivals, he was so chagrined that he would hardly speak to Captain Duncan for some time. As to the alleged wager, the latter knew nothing about it until letters received from home contained many congratulations for his winning the so-called "race."

As far as professional attainments go, a long record free from black marks is written after Captain Duncan's name. As a young man in the Kate Davenport, he was bound into Calcutta and arriving at the mouth of the Hoogli River found no tug awaiting hm. Much to the wonderment of shipping people he sailed his ship up to the city against the current of the narrow, twisting stream, skilfully working around the many bars and mud flats. It was said that this feat had not hitherto been accomplished since the days of the old East Indiamen, which ships were smaller by far.

The two East Indian voyages were very severe and trying to the master of the Florence and at their conclusion it could be seen that he was a changed man. His run from Anjer to Manila, with stops at Tegal and Seourabaya was particularly hard. In order to avoid the unfavorable monsoon then prevailing in the China Sea, he worked his ship up inside, through the Celebes Sea and all the multitudinous straits and passages, carrying on by night the same as by day, with almost no lights to go by and with charts, while the best obtainable, yet out of date and unreliable. Some of these latter, still kept as reminiscences, show stains from midnight coffee that spilled from nervous hands, penciled with plotted courses and cross-bearings. For forty days and nights Captain Duncan slept in a deck chair for only two hours at a time. There was always land close aboard, the reflection from which on calm nights was so perfect that distance was a problem almost unsolvable. There was no let down, no easy spots to rest up in.

On coming into Manila Bay, Captain Duncan found a large fleet at anchor. His ship had a fine working breeze and the captain from his post on the after house, picked out a desirable berth well down in the midst of the shipping, to reach which meant threading a way through the whole assembly. With royals and skysails off her, the Florence swept past them all and then with the well trained crew at their stations, she was swung around on her heel and ran up into the wind with such nicely calculated precision that she lost her way just at the selected spot, close beside a big British cruiser, whose captain, as he paced his bridge, paid tribute with a bow and sweep of his cap.

The accompanying view of the Florence is from a drawing made by Captain Duncan of his ship in the midst of a hurricane near Mauritius. Although having a number of sails blown from the bolt ropes, the staunch ship, after a gallant fight with the elements, escaped with but other small damage. She always had the name of being an excellent heavy weather ship. When she was built someone thought an innovation was in order so, in addition to her bow ports, similar ports for loading lumber direct into the 'tween decks were fitted into her stern just at the flare of the counter. Several times in the course of her Cape Horn voyages these stern ports had worked loose in heavy following seas, once almost disastrously. They always had to be carefully watched and the suggestion has been made that they may have been the cause of the ultimate loss of the ship.

Editorial Correspondence

Editor, Pacific Marine Review.

Dear Sir,—Referring to a very interesting article which appeared in Pacific Marine Review some time since regarding the meaning and usage of the word "Maru" in connection with Japanese shipping, it was correctly stated that only merchant men use the term, government vessels not being so designated. However, that this distinction was not always made is evidenced by the following:

There arrived at the port of San Francisco on March 17, 1860, the Japanese corvette Candinmarruh, Captain Katsintarroh, from Yeddo. Her complement was 57 men and her armament 10 guns. It was stated that she had been built in Holland some three years previously for the Japanese Emperor; was 250 tons, Dutch measurement, and cost $70,000. She came as a tender in advance of the Grand Embassy which was to leave Japan February 11, 1860, for the United States. It was published that she was the first Japanese vessel to visit this country, or, indeed, the first that had ever been permitted to visit any foreign country.

The Candinmarruh, or as it was also written, Candin Marruh, sailed from San Francisco May 8, 1860, and arrived at Honolulu May 30.

Thinking that the above may be of some interest as a matter of history, is my apology for trespass on your time and space.

Subscriber.

American-Hawaiian Group Insurance

THE American-Hawaiian Steamship Company, with main offices in San Francisco, has insured its shore and marine employes under a $1,500,000 cooperative group insurance policy purchaser from the Metropolitan Life Insurance Company. Those eligible for participation in the plan are all employes ashore on the regular monthly payroll employed in the main office at San Francisco and in branch offices at New York, Boston, Philadelphia, Los Angeles, Seattle, and Portland, Ore., also masters, first officers, chief engineers, first assistant engineers, and company pilots serving the company afloat.

Under the cooperative arrangement, the steamship company shares the cost of the insurance with the employes, who are covered for amounts ranging, according to salary, from $1000 to $10,000.

A feature of the plan is the inclusion of a total and permanent disability clause in the life contract. Under this provision, an employee becoming totally and permanently disabled before the age of 60, will receive the full amount of his insurance in monthly installments.

Safety Aboard Tankers

Summary of Major Safety Measures Taken by the Marine Department of the Standard Oil Company of California[*]

By Vincent Carroll

THE effectiveness of the work of a safety engineer is controlled largely by the attitude and interest displayed upon the part of the managing head of each company.

In this respect the Standard Oil Company of California is most fortunate in having a man at the head of the marine department who has for a long time realized the benefits accruing from an active interest in "Safety First" work. This enables those responsible for safety work in our Marine Department to obtain immediate action from the management on matters pertaining to accidents and the Safety First program.

In this connection I should like to suggest to you gentlemen, who have direct contact with your managing heads, the advisability of continually impressing on them the importance of the Safety First movement. This will maintain their interest, secure their hearty cooperation, and assure maximum benefits to all concerned.

These benefits have been apparent to our management for some time. Of paramount importance is the satisfaction of knowing that everything possible has been done to make work on our vessels and wharves humanly safe. No one who gives the matter consideration wants working conditions or equipment that unnecessarily subjects the men to painful injuries or loss of life.

The management of the marine department also recognizes the financial advantages to be derived from an intelligent study of the Safety First problem by preventing accidents before they happen. The loss of wages paid to personnel from whom no production is obtained is kept at a minimum. Ships do not suffer delays due to injuries to personnel, suits for damages from personal injuries are avoided, and in some cases death benefit settlements do not have to be made.

First Aid

Despite the many precautions taken, accidents still happen. Their injurious results can be minimized by prompt and efficient first aid treatment. For this reason our company has devoted considerable attention to first aid work, feeling that it is very definitely related to Safety First. Effective first aid treatment will frequently prevent slight injuries from becoming serious. A representative of the company's medical department, who is an expert in first aid work, makes a voyage on each ship for the purpose of instructing the crew as to exactly what should be done in case of accident. Demonstrations are also given periodically at the company's loading and discharging terminals. Each vessel is equipped with two first aid kits, one of which is maintained in the first officer's room and the other in the first assistant engineer's room.

The other day I was reading an article in the July issue of "The Log" on "Safety in the Engine Room," which I can heartily commend. One item of particular interest to me was the suggestion by the author that a first aid kit be kept near the log desk so that dressings could be applied immediately to burns, without leaving the engine room to wake some individual who may have been authorized to look after the first aid kit. I believe this suggestion excellent.

In addition to first aid, we have given considerable thought to the equipment in the medicine chest aboard our vessels. This equipment has been standardized on all ships by our medical department and selected with a view to meeting present day requirements. This department has also supplied a book of instructions, explaining how the medicines should be used. An important feature of this book, as we see it, is that all the medical terms have been reduced to common English so that the seafaring man can understand them. Written instructions are also freely supplemented with pertinent illustrations.

Personnel Cooperation

Both Safety First and First Aid are primarily dependent for their success upon the cooperation secured from the men on the job. This requires a comprehensive educational program. Having this in mind, our management addressed a letter to all marine department employees, requesting suggestions and ideas which would lead to greater efficiency and economy. While the purpose of this letter was to impress the entire personnel with the fact that all suggestions for improvements in operation, maintenance, or design would be heartily welcome and given serious consideration, it is interesting to note that many of the suggestions submitted had to do with safety. All suggestions sent in are carefully considered, acknowledged, and a report is made back to the individual who presented the idea.

Our educational program also includes the regular bulletins in the form of Safety First posters, which are sent to ships and shops. These posters are placed in the mess rooms of officers and crew and in passageways, where they serve as constant reminders of the necessity of Safety First. They show both the right and wrong way of performing certain operations, and call attention to the necessity for constant vigilance.

It is a notorious fact that seafaring men are reluctant to express themselves in writing. It is also true that their limited time in port does not permit frequent visits to the office. With this situation in mind, the management has particularly requested that in making my periodical physical inspections, I solicit suggestions from the personnel at sea and in port which lead to safer and more efficient operation. When rendering my report, all suggestions received are included, irrespective of whether or not I agree that they are practical or advisable.

Vessel Inspection

An inspection of the physical condition of a vessel necessarily includes items having a direct bearing on safety. In making these inspections I am accompanied by the captain, weather conditions permitting, or, in his place, by the first officer and the chief engineer. When inspecting living quarters, galley, meat and vegetable rooms, the steward joins us. On deck, such items as cargo winches, cargo hatches, falls, cargo boom goosenecks, in fact, all items which have any bearing on the safe loading or discharging of package goods are carefully gone over to see that they are in good operating condition, free of rust, and well greased. If there is any doubt we go so far as to lift the cargo boom gooseneck pins out of the sockets and raise the steel strong-backs in the cargo holds to make sure that they are not wedged in. All fairleads and rollers at roller chocks are tried out to see if they are free to move. Considerable expense has been incurred during the past two years for additional fairleads, changing the location of pad eyes and increasing the number of mooring bitts, all of which has resulted from suggestions of the various members of the crews. These improvements have brought about better and safer cargo handling and better mooring facilities.

Wooden paint lockers lined with sheet metal have been torn out and replaced with new paint lockers constructed entirely of metal. Special precautions are also taken to see that no rags are stowed in paint lockers.

In the engine room the general operation of the main power unit and auxiliary machinery and boilers is carefully noted. The general appearance of the power plant, with particular reference to cleanliness and the stowage of equipment and tools, is also noted. Cleanliness and safe stowage of equipment have direct bearing on safety, as oily or slippery grating, hand railing, or floor plates, and the improper stowage of equipment contribute to minor and occasionally major accidents. All guards are examined and suggestions solicited from the chief engineer, or any one else, as to the need of additional ones. We are supplanting coir mats with durable non-skid mats, with a view to lessening danger of accidents from falls. You gentlemen are probably all familiar with this type of mat and its advantages.

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[*] Address before Safety Contact officials of the Accident Prevention Department of the Marine Associations of San Francisco, July 20, 1927. Vincent Carroll is marine engineer and safety contact official of the Marine Department, Standard Oil Company of California.

In the steward's department a rigid inspection is made of the care taken in stowing meat and vegetables. The condition under the grating is especially noted, as it is here that some careless stewards permit bits of meat and vegetables to remain and decay.

Before leaving a vessel I inquire of the captain, mate, chief engineer, and steward whether they have in mind anything they would care to bring to the attention of the management.

Standing Committee

A written report of this inspection, which includes all suggestions made, is submitted to the management. A copy of the report is forwarded to the office of the port captain, where it can be seen by those interested. This report is carefully read by the management. Each subject is commented upon as deemed necessary and steps taken to put into effect recommendations approved. Many of the subjects have a direct bearing on Safety First measures. These are usually referred by the manager to a standing committee appointed for the purpose of discussing ways and means of making the marine department 100 percent efficient. This committee of practical seafaring men includes the superintending engineer, port captain, superintendent of operations, traveling inspector and auditor. These men meet once a week, discuss the various problems submitted to them, consider investigating reports of individual members, and make definite written recommendations to the management. In this manner the management is kept advised as to the physical condition of the floating equipment, the need for betterments, repairs, or new equipment, what is being done to reduce lost time accidents, and whether the suggestions offered by the personnel can be practically applied. Estimated costs are submitted for all items entailing expense.

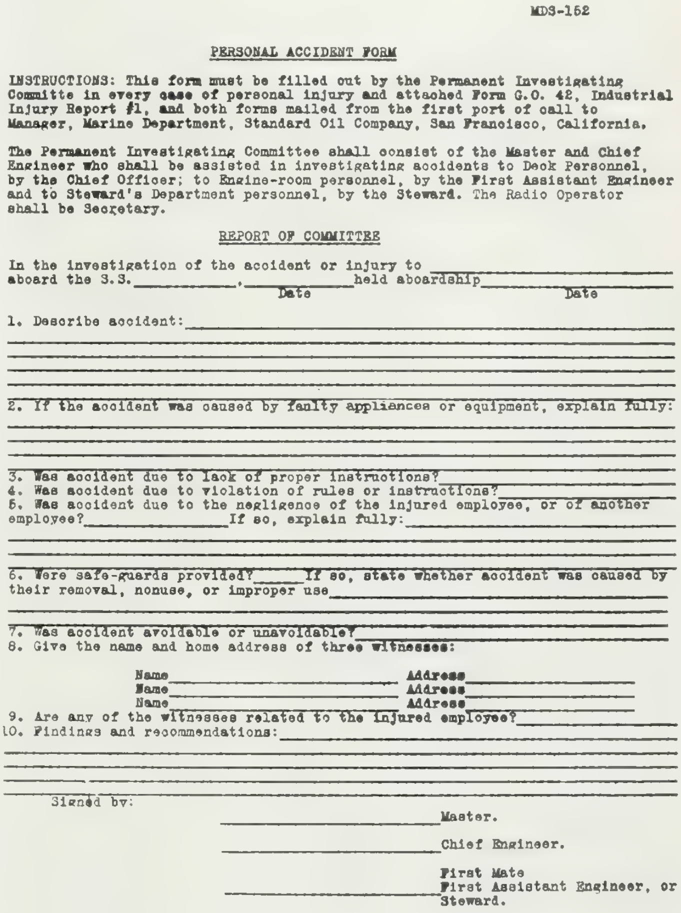
Safety First Instructions

The marine department administrative office of our company includes a division which employs vessel personnel and takes particular interest in personnel matters. One of the important duties of the men in charge of this division is to instill the Safety First thought into the seagoing personnel, especially the newly hired men. When a new man is employed, he is given a short talk on Safety First. His written instructions to report to a specific ship are enclosed in an envelope which should and generally does have the effect of leaving an everlasting impression on the man as to the necessity of exercising due vigilance and care while performing his duties. The printed matter on the face of this envelope reads as follows:

> PLEASE READ CAREFULLY
>
> We endeavor to make every position in this department a safe place to work, and your continued employment and promotion will depend, in part at least, upon your assisting us to avoid an accident to yourself or fellow employees.
>
> WATCH YOUR STEP!

It was found that some of the old time captains and chief engineers were slow to grasp the importance of the Safety First movement. With this in mind the management addresses an individual personal letter to each captain and chief engineer, requesting that he report to the manager's office at the first opportunity for the purpose of discussing ways and means of preventing accidents aboard ship. At this interview the manager stresses the importance of Safety First work, asks for full cooperation in preventing accidents and rendering first aid and gives him a statement showing detail of accidents which have occurred on his particular vessel during a given period. The mere fact that a captain or chief engineer knows that he is to be called into the office for such an interview enlists his active cooperation in seeing that everything possible is done to prevent accidents. The management insists on a thorough investigation and report of each accident for the purpose of ascertaining the cause of the accident and developing anything which can be done to prevent a recurrence. This investigation is conducted by the ship's permanent investigating committee. This committee comprises the captain and chief engineer. These men are assisted in their investigation by the first officer, first assistant engineer, or steward, depending upon the department in which the accident occurred.

The radio operator acts as secretary and renders a written report on a standard form. This form is reproduced herewith.



MDS-152

PERSONAL ACCIDENT FORM

INSTRUCTIONS: This form must be filled out by the Permanent Investigating Committe in every case of personal injury and attached Form G.O. 42, Industrial Injury Report #1, and both forms mailed from the first port of call to Manager, Marine Department, Standard Oil Company, San Francisco, California.

The Permanent Investigating Committee shall consist of the Master and Chief Engineer who shall be assisted in investigating accidents to Deck Personnel, by the Chief Officer; to Engine-room personnel, by the First Assistant Engineer and to Steward's Department personnel, by the Steward. The Radio Operator shall be Secretary.

REPORT OF COMMITTEE

In the investigation of the accident or injury to ____________
aboard the S.S. ________, ________ held aboardship ____________
Date Date

1. Describe accident: ____________
2. If the accident was caused by faulty appliances or equipment, explain fully: ____________
3. Was accident due to lack of proper instructions? ____________
4. Was accident due to violation of rules or instructions? ____________
5. Was accident due to the negligence of the injured employee, or of another employee? ________ If so, explain fully: ____________
6. Were safe-guards provided? ____ If so, state whether accident was caused by their removal, nonuse, or improper use ____________
7. Was accident avoidable or unavoidable? ____________
8. Give the name and home address of three witnesses:

Name ____________ Address ____________
Name ____________ Address ____________
Name ____________ Address ____________

9. Are any of the witnesses related to the injured employee? ____________
10. Findings and recommendations: ____________

Signed by:

____________ Master.
____________ Chief Engineer.
____________ First Mate
First Assistant Engineer, or
Steward.

The findings and recommendations of the committee are considered important as they come from first-hand sources of information. When received by the management the report is referred to the standing committee in the home office, previously referred to, which takes the necessary steps to prevent a recurrence. This report constitutes complete evidence as to what transpired at the time of the accident, and, inasmuch as it includes written statements of witnesses, it protects the company from unfounded claims. They are analyzed, tabulated, and charted in comparative statistical form, which enables those concerned to see what effect the Safety First work is having in reducing accidents and lost time.

Special Tanker Equipment

An important item on an oil tanker, and one that has a direct bearing on Safety First, is the gas mask. These masks are tried out once a week, immediately after the life boat drill, and instructions are given the crew as to how the equipment should be used. We have developed a standard set of signals for the use of the man who is using the gas mask in the cargo tank and the man on deck handling the life line. These signals are stamped on brass plates, one of which is fastened to the bolt which is placed around the man using the mask and the other is fastened to the equipment on deck. This arrangement avoids all chance for misunderstanding of signals. As this equipment on each vessel is standard, personnel can transfer from one ship to

(Continued on Page 18, Ad. Section)

Highest Powered Naval Vessel

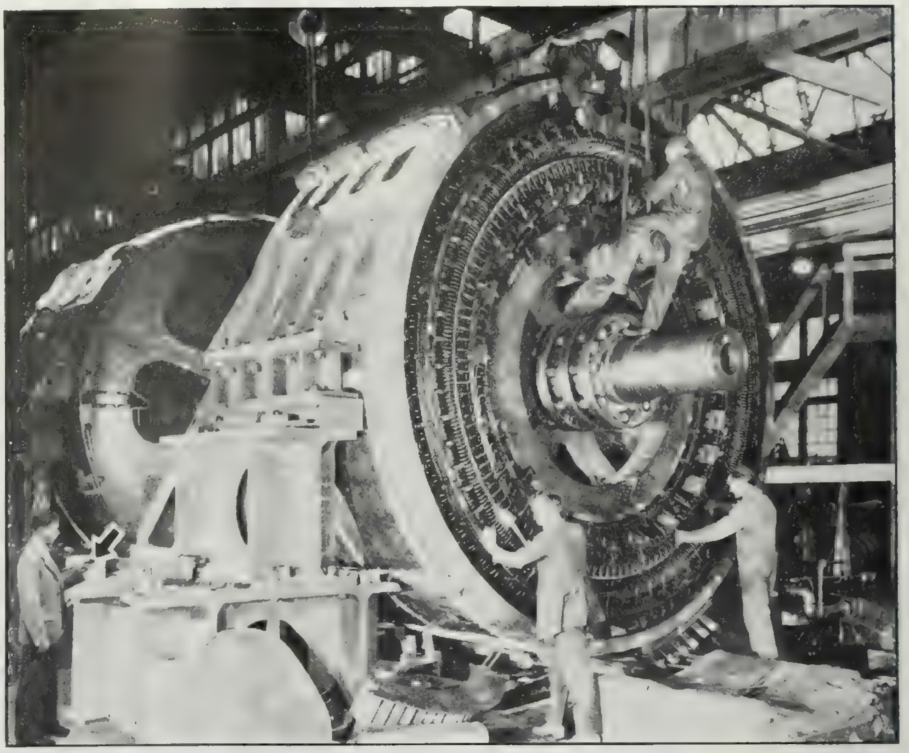
THE U. S. S. Lexington, largest and highest powered naval vessel in the world, will be ready for her trials at sea within the next six months. Final touches are being made on the ship at the Fore River Plant of the Bethlehem Shipbuilding Corporation, Quincy, Massachusetts, where she was launched two years ago.

The Lexington, like the Saratoga, which was launched in the spring of 1925 at Camden, N. J., is an airplane carrier. Originally these two vessels were to have been battle cruisers and as such would have been among the navy's largest fighting vessels. Due to the modification of the American naval program decided on at the Conference on the Limitation of Armament the ships were converted to airplane carriers.

Because of the minimum superstructure the Lexington seems unusually low in the water. The long sweep of flying deck, broken only by a massive combined funnel enclosure set at one side of the hull, resembles a marine drill ground. The elevators are so constructed as to come flush with the flying deck making an unbroken flying surface about 900 feet long. These elevators are capable of hoisting the largest type naval planes A secret contrivance is set on the deck floor to stop landing airplanes within a distance of several hundred feet. This equipment is said to be fool-proof and to prevent possibility of any mishap in landing during a rough sea. To make up for the preponderance of weight on the starboard side where the cranes, the group of funnels, and gun turrets are located, oil, gas, and water tanks are built into the port side of the vessel. When oil and gas have been consumed in large quantities water ballast is substituted in their place.

The crew's quarters are on the deck beneath the flying deck and the hangar deck is below that, thus receiving the protection of two upper decks from explosives that might drop on the ship by enemy airplanes. Below the hangar deck are five more decks, making eight in all.

The ship's armament, in addition to the 106 airplanes which she carries, consists of eight 8-inch 50-calibre long range rifles and twelve 5-inch 50-calibre anti-aircraft guns capable of warding off destroyers as well as enemy aircraft attacks. These latter guns are nested in groups of three at strategic points about the ship which facilitates concentrated and accurately directed fire as well as rapid supply of ammunition. According to her officers, the ship, with combined airplane and gun attack, is capable of meeting single handed any existing battle fleet.



Two of the eight propulsion motors of the U.S.S. Lexington. Man at left is holding smallest commercial motor built.

The flying deck will accommodate at one time the entire ship's complement of set-up airplanes and still leave sufficient room for a take off. Near the bow is a newly adopted device for launching sea planes.

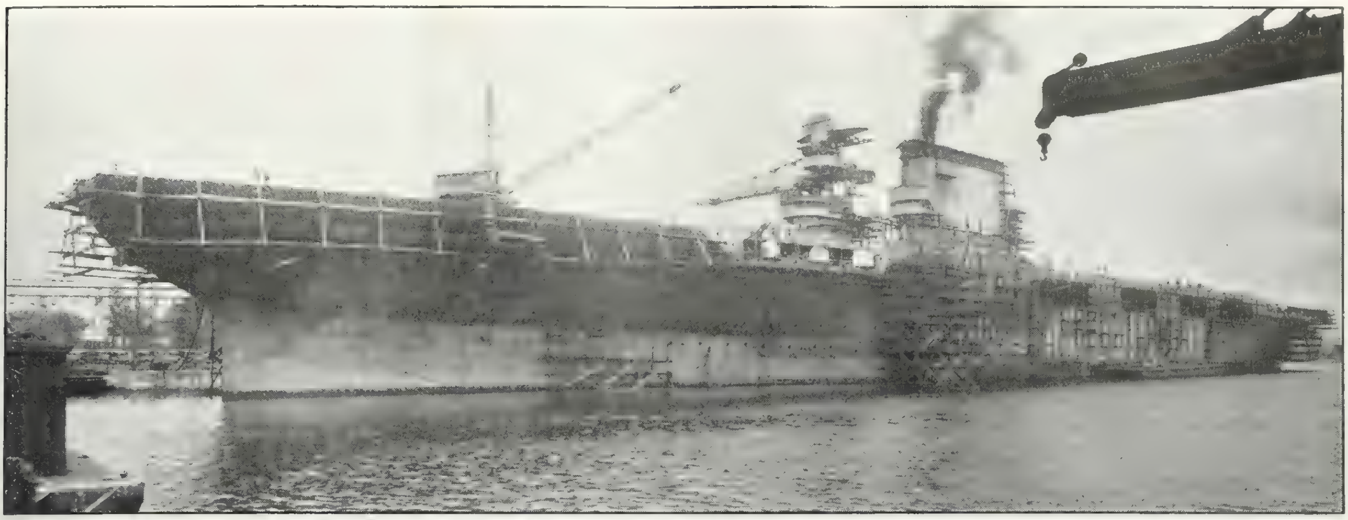
There is a complete hospital on board with an isolated ward for contagious diseases and an operating room with the latest modern equipment.

Machinery

The Lexington will be propelled by electric machinery developing 180,000 horsepower, which is greater than the combined output of the six electrically driven capital ships now in commission, the New Mexico, California, Tennessee, Maryland, Colorado, and West Virginia. The Lexington is a floating airplane field and electric generating plant combined. Her speed will be more than 33 knots, or 12.6 knots more than the speed of the Maryland. She is the longest naval vessel in the world with a length of 874 feet and a beam of 105 feet; she weighs more than 33,000 tons.

The propulsion apparatus which was designed by engineers of the General Electric Company would supply the electric demands of the entire city of Boston. The machinery comprises four 35,200 kilowatt turbine generator sets which supply current to eight powerful motors. The generators will be operated by steam from sixteen oil-fired boilers. The motors will drive the ship at 33 knots, equivalent to about 39 miles an hour or the speed of the average express train.

The eight motors will be connected in pairs to each of the four propeller shafts. Each motor has a capacity of 22,500 horsepower and measures 15 feet in diameter. A total of 45,000 horsepower will be delivered to each shaft which will drive the propeller blades at 317 revolutions a minute. All other subsidiary power demands on the Lexington will be supplied by six 750-kilowatt direct-current turbine generator sets. This equipment will operate the steering gear, anchor windlass, ventilation fans, lighting systems, radio, telephone,



Lexington at outfitting dock, Fore River Plant, Bethlehem Shipbuilding Corporation.

and telegraph, elevators, searchlights, fire alarm system, cooking apparatus and refrigeration.

The radio equipment will include all the latest facilities for sending and receiving messages. The aerial will be run to the deck from a single topmast which must be lowered when the vessel passes under the Brooklyn Bridge.

When the Lexington goes into service with her full complement of officers, men and airplanes she will have cost the Government $45,000,000, and will have the largest crew on any ship afloat.

There are several fully equipped machine shops on board and many carpenter shops. There is a sheet metal shop, a plumbing shop, and a sewing shop with more than 40 sewing machines to care for the clothing of the crew and the fabric for dirigibles and balloons. For the recreation of the men, reading and rest rooms and a motion picture theater are provided. There is a cobbling shop with the latest machinery. Each of the more than 600 separate "rooms" on board is supplied with a loud speaker so that from any one of several central stations about the ship any officer or man may be immediately reached. Each room can be made water-tight and each has a thermostat for signalling fires. Battleship linoleum is laid on the entire floor space of the ship with the exception of the flying deck. The Lexington is so large that the channel at Fore River will have to be widened and deepened before she can reach the high seas.

Williams Line Expansion

THE Williams Steamship Company, Inc., have just acquired the steamers Oregon, Western Glen, and Westmead, to be placed in their intercoastal service, increasing its fleet to ten steamers, enabling the Williams Line to put on a ten-day service beginning in September.

The steamer Oregon will be renamed the Willbabco, the Western Glen renamed the Willwello, and the Westmead renamed the Willanglo. The steamer Oregon was recently operated by the United American Line in the intercoastal trade. The Western Glen and the Westmead have just been purchased from the United States Shipping Board and are to be converted into oil burners and reconditioned and equipped for the intercoastal trade.

The Williams Line started its intercoastal service in December, 1920, with four steamers, the Willfaro, Willpolo, Willhilo, and Willsolo, and operated three additional steamers under charter until last fall when they were withdrawn by their owners on account of the high freight rates in transatlantic trades due to the coal strike in England. The Williams Line, in order to maintain its regular service, acquired the steamers Willkeno, Willboro, and Willzipo, and, with the addition of the Willbabco, Willwello, and Willanglo, will have about 100,000 tons deadweight capacity, which makes it the third largest intercoastal fleet now operating.

George T. Williams, president of the company, and A. F. Zipf, vice-president, in attending the Intercoastal Conference meeting at Hot Springs, Arkansas, last January, were very pleased to have their statement confirmed that the Williams Line had carried, during the year 1926, a much higher class of cargo than any other line operating in the intercoastal trade, with the exception of passenger and weekly service lines.

The Williams Line expect to reduce their running time from coast to coast to 17½ days, this being possible, as all steamers of this line have large horsepower capacity and are capable of making the necessary speed. The consistent support of shippers and consignees and the appreciation by them of the services rendered has lead the Williams Line to believe that the new service will be well patronized.

Soft Soap and Hard Law

A Fable Dealing with Sherman's Law, Clayton's Act, Mergers and Emergencies*

By Henry A. Guiler

FROM time immemorial soap has held a respectable place in the history of the world. The Romans called it "sapo" or "sapon," but whether this is a good name for it or not is immaterial, albeit many "saps" have used it from times beyond which the memory of man runneth not to the contrary and have been much benefited by such use. Also many wise men have done so. Pliny says that the Romans accredited the invention of soap to the Celts when during their conquest of Gaul he found them gargling their fingers with it. It is not known whether the Celts used soap externally so as to be able to slip through the hands of the Romans, but at any rate the Romans thought it a good idea and at times thereafter used it on themselves. Some Romans use it now. But Roman soap is not the soap invented by the Celts who, so far as we know, still use it wherever they go. At any rate we should worry as to its origin. It is here, and come to stay. Jimmie still gets it behind the ears, Lizzie still gets it in the neck, papa still, with many imprecations, slips on it in the bath tub, and high-toned mama, preferring complexion creams, still refuses to put it on the skin you love to touch. Therefore, to satisfy all needs, the saponification of stearine, palmitine, oleine, alkali, tallow, palm oil, olive oil, bone grease, kitchen fat, caustic soda, potash, and rosin still goes merrily on, and workmen still test its various degrees of perfection by its appearance, taste, and smell. (Hard luck on the workmen!) The passers-by also know that soap is being manufactured when the gentle breezes waft the odors of boiling bone grease and kitchen fat in their direction and accordingly hasten their steps or step on the gas.

But all this did not worry Bill Jones, the sales manager of Barker and Company, Inc., manufacturers of Roseblush soap, as he sat meditatively in his office at the factory in South San Francisco and puffed an old black pipe to deaden somewhat the odors which from time to time permeated the atmosphere. He had other troubles. Though the warm California sun shone brightly through the windows, the encircling gloom of his countenance was deep and almost stygian. Likewise was that of his confrere, Jack Andrews, the advertising manager of the same firm who was also among those present. So far as they were concerned, the sun might have gone down in its wrath and the walls of Jericho might have fallen down next door to them and they would never have noticed either event. They both had other and worse troubles. Old man Barker, their boss and president of the company, had called them on the carpet a while before and had told them that they were not doing their stuff as both sales and profits had fallen off lamentably. He also swanned that, unless some improvement took place and that pronto, they could both take the air. So, after several years of good and faithful service, this announcement was, to say the least, disconcerting and to their minds unwarranted. Anyway, so thought Bill and Jack, for in their opinion they had done their damdest and no man could do more. But the fact stood out as plain as a pikestaff that the usual improvement in sales was not evident despite all sales efforts and the advertising did not 'pull" as it should. Hence their thinking parts and their corrugated and wrinkled fronts. They could not blame the old man for his tirade. It was justified. But the answer was not easy. What to do about it was the question.

Roseblush soap was a standard article and had stood the test of many years. It was made of the best materials and in the most workmanlike manner. The public had approved of it, as was evident from past sales. Bill's specialty salesmen were go-getters, honest, faithful and reliable in every way. His jobbers and dealers throughout the West could not be beaten and apparently pushed the sales of Roseblush soap to the utmost. The price was reasonable and fair, and as low as good business and their costs could stand. Bill had furnished his salesmen with a pamphlet, composed by himself, containing every argument known to the trade in favor of Roseblush and the best possible sales hints. He had called them together from time to time to hear encouraging and inspiring sales talks. He had formed a "Hundred Per Cent Club," to which all salesmen making the largest number of sales belonged. This club carried with it longer vacations, extra bonuses, and free trips for the men making the most sales. He had given his jobbers and dealers free deals to encourage their sales and the patronage of the public. Could a sales manager do more? "Let's see!" said Bill.

Likewise Jack, the advertising manager, pondered deeply. Had he done anything out of the way or made any mistakes in his advertising campaigns? Or had he left anything undone which he could have done to make his advertising pull? He had used the best magazines, periodicals, newspapers, and other publications to make good in his campaigns. He had furnished the best cuts and most attractive drawings from the best staff of artists. His slogans were highpowered and sure to "knock 'em dead." His jobbers and dealers were supplied with sure-fire pamphlets and advertising helps. He had furnished his dealers with counter and window displays which always drew the attention of prospective customers. In short he had done everything possible to put Roseblush soap on the map. But still sales did not improve and profits were at a standstill. The old man was right. Jack's advertising did not pull. Could a sales and an advertising manager do more? "Let's see!" said Bill and Jack.

For a long time Bill and Jack sat still and gazed out of the window. Where cerebration should have been going on under the hair of their craniums, nothing but vacuum existed. Even the bubbles did not percolate through their think tanks. Even the bats did not fly around their belfries. Not even Lord Byron's "voices of the dead" came to assist them. Something reminded Bill of the fishermen in Nova Scotia in winter time, some of whom "set and think and other just set." They glowered at each other in search of an idea and a way out. None seemed to be at hand. All was gobs of gloom of the darkest hue. Then with a yell like a wild Indian, Jack jumped up out of his chair and said "I have it! I have it!" Said Bill, "You blithering

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There has been much talk recently about merging certain competing steamship companies. The Sherman Law and the Clayton Act are not very well understood, and this fable is offered as a good natured suggestive warning by a competent San Francisco Attorney.

idiot, you might as well kill a fellow as scare him to death! What have you? Sit down and elucidate if you've anything worth while in your noodle." Said Jack, "Bill, there's nothing wrong with you or me or our systems. We're all right. The trouble is that our only real competitors, the Slippo Company of Portland, and the Greaso Company of Seattle, are putting something over on the old man." Said Bill, "By George, I believe you're right, Jack. Let's investigate and if we can get the goods on them, let's see the old man again and get his O.K. on making their fur fly."

Bill and Jack both made a trip around the West and learned from the underground and otherwise that both Slippo and Greaso had been making secret concessions in price to Roseblush's jobbers and dealers and were even attempting to hire away by special inducements, their best salesmen, some of whom had gone over to them. The jobbers and dealers consequently were not pushing Roseblush but were hiding it under the counters while bringing to the front Slippo and Greaso. The dealers were cutting the prices of their competitors' soaps and not attempting to move Roseblush at all. Some of Bill's salesmen were demoralized and half hearted in their sales efforts. Eventually, of course, the public was loading up heavily on Greaso and Slippo and giving Roseblush the go-by. "They're not going to get away with anything like that!" said Bill. So he and Jack took the whole situation up with old man Barker and got authority to do what was necessary to combat the enemy.

First of all Bill called the salesmen together and gave them a shot of pep in the arm which started them on their trips determined to do or die for the honor of Roseblush. Then he gave the jobbers and dealers particular h—l, which did them a lot of good. Being stronger than Greaso or Slippo, he started a price cutting war that made their hair stand on end. Jack put in his nickel's worth by flooding the whole West with high powered and sure fire advertising. The public with its ear always to the ground began to eat up Roseblush with a vengeance. The factory eventually was flooded with orders and nobody seemed to want to buy Slippo and Greaso soaps.

Then the expected happened. Slippo and Greaso came around to old man Barker to beg off and suggested a price agreement covering the West. The old man would have none of this after his previous experiences, and besides he had a vague recollection that such would be illegal. Anyway, this was out, for he could not trust Greaso and Slippo. Then they came back with an offer to merge with Roseblush in some way. This seemed more reasonable to old man Barker if the control was his and the price was right. It also seemed economically sound that such ruinous competition should be at an end.

The upshot of the whole affair was that Barker and Company, Inc., bought all the stock of the Slippo Company outright and the old man thereafter controlled its affairs as he desired. The Greaso Company's stock was thereafter acquired and later on that company was dissolved and its plant and assets became the property of Barker and Company, Inc. After this was over prices for Roseblush, Greaso, and Slippo soaps were made higher and uniform by old man Barker throughout the Western States. Competition from the outside was now negligible. The public was compelled to buy one or the other of these soaps or else next to nothing. Bill and Jack, having done their stuff well and faithfully and being relieved of the old man's criticism, felt that a good job had been accomplished. The sales and profits increased by leaps and bounds and the goose hung high for Barker and Company, Inc.

In all this time, the old man had not thought of consulting a lawyer as to the legality of the merger, considering it a waste of good money to do so. Besides this he was too busy to bother about lawyers or the law anyway. A month or two after this deal was put over an agent of the Federal Trade Commission saw old man Barker and requested and was granted permission to go over his merger files and also to get full information as to the status of the transaction. He put the old man, Bill, and Jack on the grill for a couple of days and left knowing all about the deal. The three musketeers, after this visit, had a creepy and uncomfortable feeling but, secure in their own minds of their innocence of wrongdoing, soon forgot all about the matter. After all, they felt sure that they had done nothing but what was good business and economically correct.

All of a sudden things began to happen. Old man Barker, one bright morning, read in the paper that the Federal Trade Commission had filed a complaint under Section 7 of the Clayton Act of 1914 in which it ordered Barker and Company, Inc., to divest itself of the stock, plant, and assets of the Slippo Company and also of the Greaso Company because of the illegal merger that had been formed with its resultant cessation of competition among the three companies. Old man Barker, Bill, and Jack were aghast at this event. Barker rushed over to his lawyer, Joe Cook, to find out where he stood. After he had adequately retained Joe with the customary substantial fee, Joe also put him on the grill. Barker admitted to Joe that the purpose of the whole deal was to eliminate competition and competitors and to get the whole business into his own hands, if possible, so that prices could be made uniform. Barker was full of fight and indignant at this accusation by the government.

Joe told him to calm down and get off his high horse, for the government might be right in what it was doing. Old man Barker went away crestfallen at the thought of the possible wreckage of his pet scheme. At another interview, Joe told Barker that he would have to settle with the Commission as best he might. He advised Barker that the courts had decided that the old man must divest Barker and Company of the stock of Slippo Company and being caught redhanded before reducing the assets of that company to possession and ownership, could not now use the stock to acquire those assets. He told him also that the Commission was wrong as to its order to divest Barker and Company, Inc., of the stock, plant, and assets of the Greaso Company. In that case the courts, after the stock had been illegally acquired and the plant and assets had become the property of Barker and Company, Inc., on the dissolution of the Greaso Company, would not under the Clayton Act do a nugatory thing by ordering the return of valueless stock to former owners. Neither would the courts under the Clayton Act order the plant and assets returned. Joe also told him that he would be lucky if the Commission should allow him to settle the matter that way on an agreed statement of facts without a long expensive fight and the taking of testimony all over the West ending finally in the Supreme Court of the United States. He told him also that he was lucky if he were allowed to retain the plant and assets of the Greaso Company because, after the Federal Trade Commission

(Continued on Page 30, Ad. Section)

The Evolution of Marine Radio

Remarkable Strides made in the Oldest Branch of the Radio Communication Art Since the Introduction of the Vacuum Tube

By T. M. Stevens, General Superintendent, Marine Department, Radio Corporation of America

LOOKING back, it seems that marine radio for many years led a staid, dignified, and hard-working sort of existence. It got along with the spark transmitter and simple receiver as best it could, even though it might well have cast an envious look landward, where transoceanic radio and radio broadcasting were enjoying the popularity which followed the latest advances in radio engineering. Yet slender threads of communication were established and maintained between ships and shore. Priceless human life and precious cargoes were guarded day in and day out in the ceaseless stream of vessels over the seven seas. Radiograms were hammered out from ship to shore and from shore to ship, to the best ability of the radio operator and at the pleasure of the elements. Then, in moments of grave emergency, marine radio, with such equipment as it had, never failed to rise to the occasion, for there is none braver than 'Sparks," the radio operator aboard ocean greyhound or wallowing freighter.

In 1920 the Radio Corporation of America found it necessary to establish a system of coastal stations in order to render prompt and efficient public radio telegraphic service to and from ships. Two-kilowatt stations were installed at New York and Cape Cod. Other spark stations were then in operation, or about to be placed in service, at Cape May, New Jersey, Babylon, Long Island, Brooklyn, New London, Newport, Siasconset, Boston, and Bar Harbor. Shortly after, spark stations were established at East Hampton, Long Island, and Rockport, Maine. Thus we see that there were no less than twelve spark stations in operation along the American Atlantic coast from Cape May to Bar Harbor. All were operating on only two wave lengths, 600 to 450 meters. Approximately 90 per cent of the traffic to and from ships was handled on these waves. One may well imagine the bedlam of interference to radio telegraphic service caused by so many stations, with broadly tuned spark transmitters, working on two waves!

With the advent of broadcasting and its rapidly growing popularity, broadcasters immediately took up channels on both sides of the 450-meter channel of marine radio, and crowded in more and more as broadcasting spread out with its ever-growing list of stations.

Broadcasting Babel

A veritable Tower of Babel appeared at hand, while radio broadcasters, for their part, were none too gentle in their comments on the dot-dash messages of marine radio which overflowed the 450 and the 600-meter channels and broke into their midst at the most inopportune moments. But ship operators held a similar opinion of broadcasting programs, which broke up their traffic, so that honors were about equally divided.

It was in these trying times that necessity, as the novelist would have it, gave birth to the vacuum tube transmitter for radio telegraphic work. The first transmitter of this type for commercial telegraphic use in this country was installed at Marion, Massachusetts. It was operated on 2200 meters and remotely controlled from the receiving station at Chatham, some 55 miles away. A few of the transatlantic passenger vessels were by this time equipped with either arc or tube transmitting equipment for continuous-wave operation. In short order the shipboard operators, as well as those at Chatham, were astounded at the remarkable distances covered with the continuous-wave vacuum-tube transmitters. The larger ships began to use the long-wave channel almost exclusively for their traffic, and it became necessary to provide additional receiving channels at the Chatham station. The shipboard transmitter could then be quickly shifted from 2100 meters (the usual calling wave used by ships) to 2000, 1900, 1800, etc. Thus Chatham could receive from three ships and transmit to a fourth vessel all at the same time.

Vacuum Tube Transmission

It will therefore be noted that the use of continuous-wave vacuum-tube transmitters not only increased the range of marine communication, but greatly facilitated the movement of traffic due to the possibilities in multiplex operation. Also, a heavy load was removed from the shorter wave lengths, aiding the smaller ships in clearing their traffic.

The increased range also made unnecessary the further operation of numerous stations along the Atlantic Coast. The Bar Harbor station practically ceased commercial activities and the stations at Rockland, Newport, Siasconset, New London, Babylon and Cape Cod were closed.

As the radio broadcasting activities rapidly expanded, the elimination of spark stations on land was pushed with all possible speed. The 5-kilowatt spark transmitter at Bush Terminal gave way to a tube transmitter. The Chatham station was expanded by the addition of two 5-kilowatt long-wave transmitters, installed at Marion, and two short-wave transmitters at the station itself. The Tuckerton station, replacing Cape May, used a 5-kilowatt vacuum-tube transmitter. A 1-kilowatt set replaced the 5-kilowatt spark at Boston. The same type set replaced spark equipment at Galveston. Apparatus similar to that of Chatham replaced spark sets at San Francisco, and a special continuous-wave set was installed at Los Angeles. The Chicago coastal station for the Great Lakes was provided with tube equipment similar to that at Galveston and New York. And thus all coastal stations of the Radio Corporation of America did away with spark transmitters and their former interference with broadcast entertainment. The Army, the Navy, and the Coast Guard, during the past year, have also made remarkable proress in eliminating spark interference, so as to round out a nearly ideal condition.

Let me add, however, that the coastal or land station end has been only one part of the huge task of bringing marine radio up to the very peak of present-day efficiency.

Ship Equipment

There has remained the major part of equipping and reequipping the many ships with the vacuum-tube ap-

(Continued on Page 30, Ad. Section)

A De Luxe Passenger Liner

City of Honolulu
Interiors
Depict
First Class
Floating Hotel

Above are shown a few vistas in the first-class suites and state rooms of this beautifully appointed vessel and at the right a view of the Pompeiian swimming pool —the first swimming pool ever built into a hull on the Pacific Coast. The City of Honolulu is proving to be an excellent seaboat, very comfortable in rough weather, and is a great favorite on the Los Angeles-Honolulu run.

Inter-Island Passenger Liner

Union Plant of the Bethlehem Shipbuilding Corporation Building Fine Passenger Steamer for the Inter-Island Steam Navigation Company of Honolulu

THE Inter-Island Steam Navigation Company of Honolulu recently signed a contract with the Bethlehem Shipbuilding Corporation, Ltd., covering the construction of a passenger and freight vessel for their Hawaiian services. The keel for this vessel has been laid at the Potrero Works of the Union Plant of Bethlehem, and it is interesting to note that these works, formerly the Union Iron Works, built the first steel steamer constructed for the Inter-Island firm and practically every vessel built for them during the last thirty years.

The new vessel will have the following general characteristics:

Length over-all	310′ 10″
Length bet. perpendiculars	295′ 0″
Beam, molded	48′ 0″
Depth, molded to shelt. dk.	27′ 6″
Loaded draft	17′ 4½″
Displacement, about	4323 tons
Deadwt. capacity, about	1800 tons
Shaft horsepower	4000
Sea speed	15 knots

As shown in the inboard and outboard profiles, this steamer will have a cruiser stern and straight stem, with a very graceful sheer line, giving a trim and pleasing appearance to the hull, an effect that is emphasized by the decided rake of masts and funnel. The design is a flush two-deck hull with a two-deck steel superstructure. There are six water-tight bulkheads dividing the space between main deck and tank top into seven water-tight compartments, which from stem aft are: forepeak tank, cargo hold No. 1, cargo hold No. 2, boiler room, engine room, cargo hold No. 3, afterpeak and steering gear compartment.

A rather novel feature is incorporated in the design of the cargo hatches and the automobile access and storage in the forward cargo spaces. A water-tight bulkhead splits the cargo hatch on the main deck forward, making a single hatch serve cargo holds Nos. 1 and 2. The sheer of the main deck is reduced to zero from about amidships to a point at the after end of this hatch, and from that point forward the sheer is maintained parallel to that of the shelter deck. This gives the forward 'tween decks space ample vertical clearance for a large side port that affords head room for any automobile to drive aboard with top up. The shelter deck line is broken at the forward end of this 'tween decks space and that deck dropped to allow ample head and air space in the forecastle without an undue raise in the forecastle deck.

Carriage of fuel oil is arranged for in the forepeak, No. 1, No. 2, and No. 4 double bottoms, the after wing tanks, and the settling tanks, with a total capacity of 530 tons. Fresh water will be carried in the after peak, No. 3 double bottom, and the culinary tanks with a total capacity of 146 tons.

With all oil tanks except forepeak full, all water tanks full, the forward 'tween decks full of automobiles, refrigerated cargo space full, and boilers at a steaming level, but with no passengers or crew aboard, there would be 464 tons of fuel oil, 146 tons fresh water, 20 tons of automobiles, and 1170 tons of cargo on a mean draft of 17 feet 4½ inches, with 17 feet 1½ inches forward and 17 feet 7½ inches aft.

Passenger accommodations are provided for 218 first class and 96 third class, with a crew of 67.

Machinery

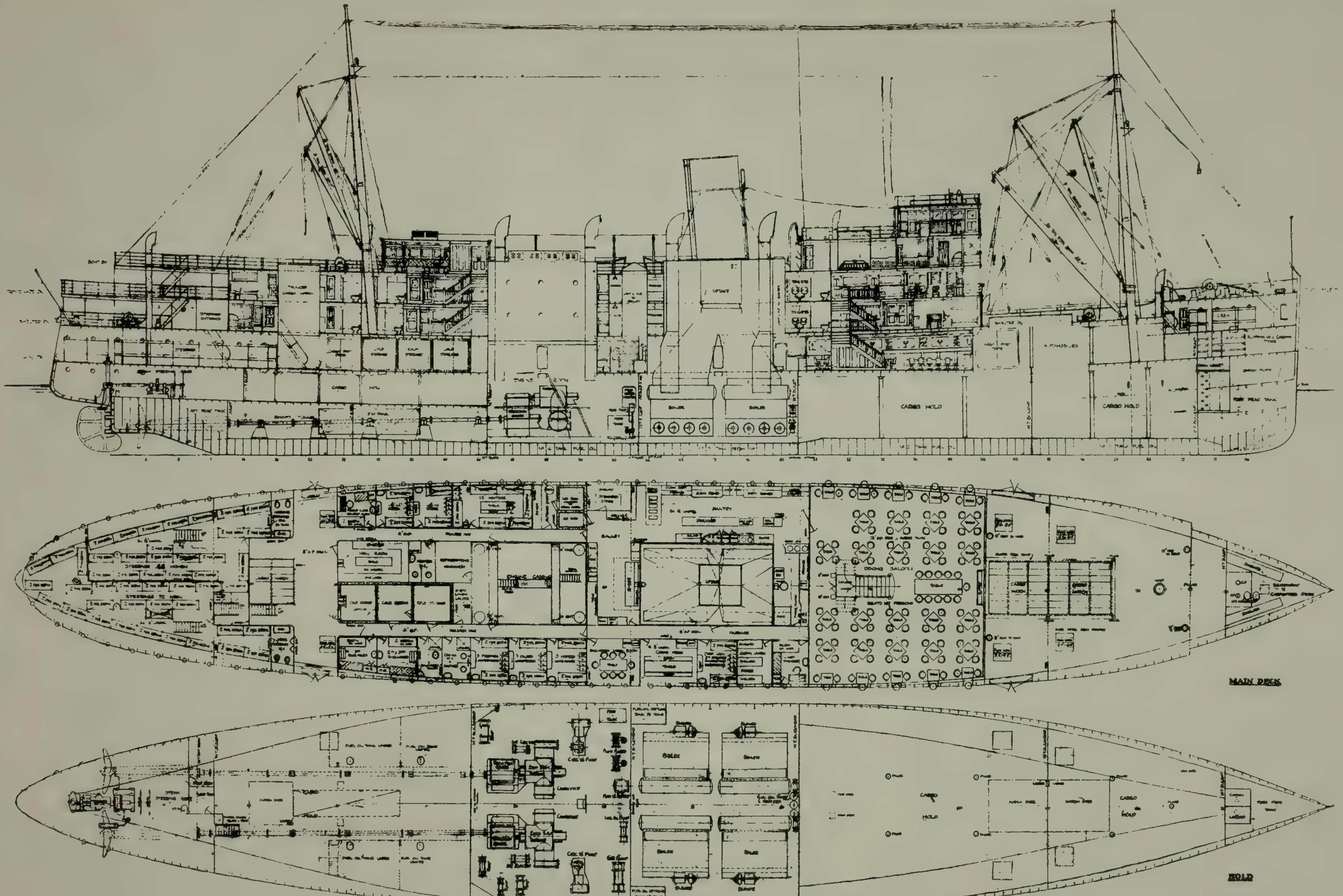
Four Babcock & Wilcox marine type water-tube boilers will supply 265 lbs. gauge pressure and 75 degree superheat steam at the throttle to Westinghouse complete expansion type turbines. Each of the twin propeller shafts will be driven through double-reduction single-pinion gearing by an independent turbine of this type, the turbines and gears being especially designed for this job. Each turbine consists of a two-row impulse wheel, 22 rows of reaction blading, and a two-row impulse reverse wheel located in the exhaust chamber. An emergency overspeed governor of the new Westinghouse oil actuated impeller type will be fitted on each turbine. A suitable connection is provided whereby the surplus exhaust steam from several steam driven auxiliaries may be used in the low pressure range of the reaction blading on the main turbines. These steam driven auxiliaries include two 100-kilowatt generating sets and two circulating pumps driven by geared turbines and are all supplied by Westinghouse. A special effort is being made to secure the most economical steam balance and the best over-all efficiency possible in this plant.

The reduction gears will be of the Westinghouse floating frame type, which automatically adjusts itself to preserve gear face alignment under conditions of gear case distortion arising from the weaving of the hull structure at sea. The pinion shaft of each gear is provided with a worm reduction motor driven turning gear, and Kingsbury thrust bearings are fitted on the forward end of the main gear shaft.

Westinghouse motors are used throughout on auxiliaries, and Westinghouse galley type electric ranges and bake ovens will be installed.

The Inter-Island Steam Navigation Company will now have a fine fleet of passenger and freight steamships, with its many wooden and steel freighters and its two modern passenger vessels, the Haleakala and the as yet unnamed new vessel described above. The growth of this American firm is an eloquent tribute to the wisdom of our laws limiting coastwise traffic to vessels of American ownership and registry. Many old timers on the waterfront of San Francisco can easily remember the beginnings of this firm and the building of small steam schooners for them at about $80,000 apiece by the old Fulton Iron Works. Now their trade demands vessels costing well over $1,000,000 each, and it has just begun to grow. In another year or two the Inter-Island company will be needing more vessels of this type or larger.

New Inter-Island Steam Navigation Company Passenger Liner



Inboard profile, Main Deck and Hold Plans.

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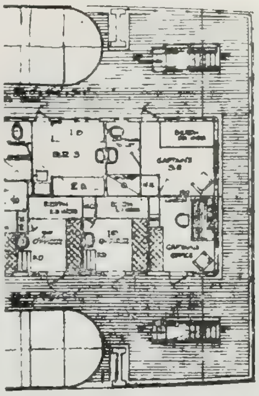
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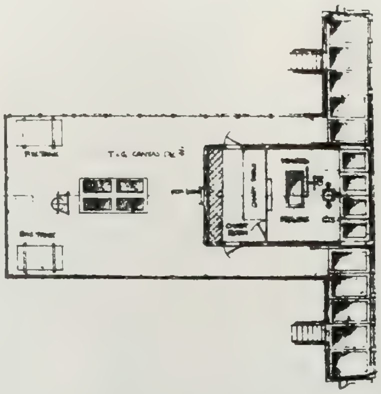
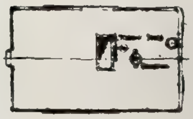

NAVIGATING BRIDGE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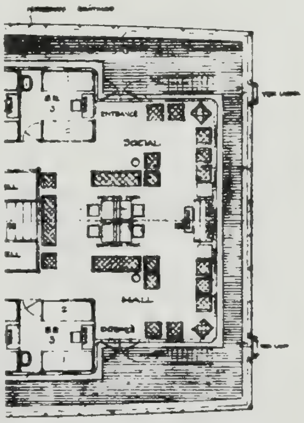

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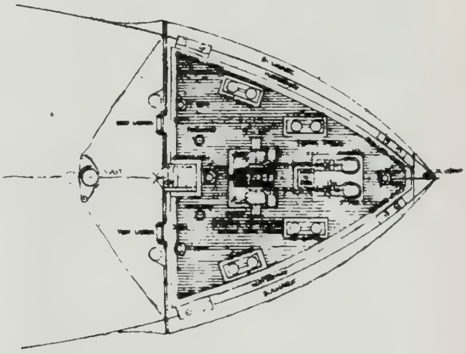
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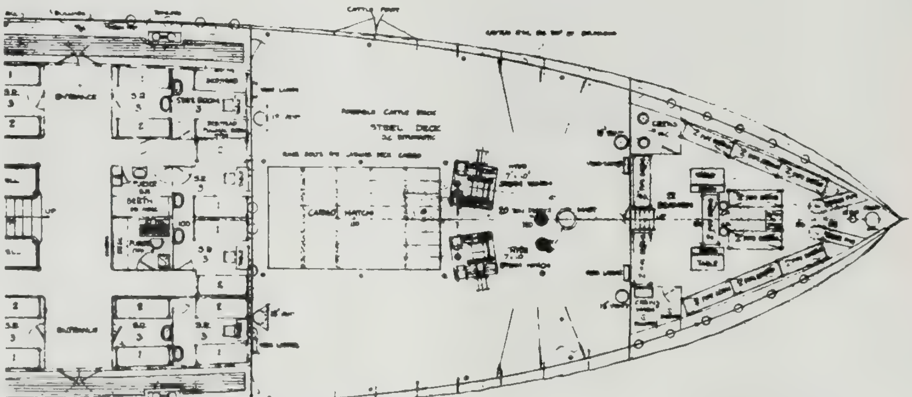


SHELTER DECK

Design of Shipping Terminals for Accommodation of Truck and Rail Traffic*

By George F. Nicholson, Harbor Engineer, Los Angeles

THAT the motor truck is influencing transportation and terminal problems throughout the entire world is readily apparent to all harbor authorities. It is doubtful, however, if any section of North America has been so greatly influenced by this mode of freight transportation as the Pacific Coast. The rapidly increasing volume of general cargo handled to and from the West Coast ports by means of motor trucks is presenting an ever-changing problem of segregating rail loading and truck loading facilities and of eliminating costly traffic congestion on wharf and pier approaches.

In the past few years the motor truck has become an important and permanent factor in the concentration and distribution of cargo for these ports. At practically all the Pacific Coast ports there has been a steady increase in the percentage of general cargo handled by this means of transportation since its advent.

In the fiscal year 1923-1924 statistics disclose that approximately 40 per cent of all general cargo and lumber passing through the Port of Los Angeles was hauled by motor trucks. In the fiscal year 1924-1925, this percentage increased to approximately 48 per cent, and again during the year 1925-1926 similarly increased to 55 per cent.

In March of this year, our traffic department made a careful study of the relationship existing between the two modes of transportation with particular attention to terminals where only general cargo is handled. The item of inbound lumber, which commodity was included in the figures herein above mentioned, was excluded from consideration in this study.

An analysis of foreign or offshore cargo handled by eight steamship companies during the calendar year of 1926, import and export combined, disclosed the fact that 60 per cent of this cargo was handled by truck and 40 per cent by rail. Percentages for individual shipping companies varied greatly between the extreme conditions of 13 per cent truck and 87 per cent rail shipments for one company handling chiefly South American nitrates, and 4 per cent rail and 96 per cent truck shipments for one transatlantic line handling Australian cargo.

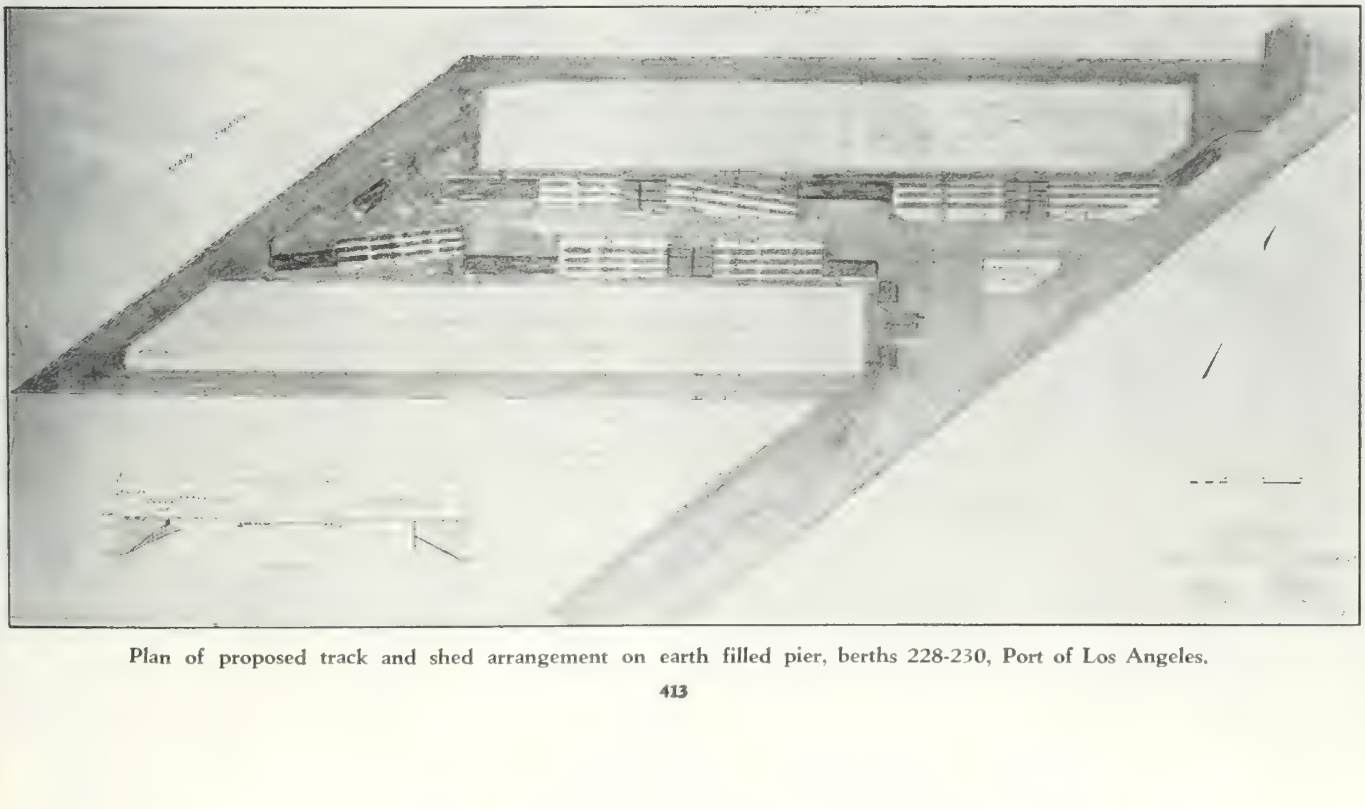
A study of intercoastal cargo handled during the five months ending March 1, 1927, shows tonnage divided between rail and truck traffic as follows:

Cargo tonnage moved by truck		60%
Cargo tonnage moved by rail at shipside tracks	12%	
Cargo tonnage moved by rail at rear or end platforms of sheds	28%	40%
Total		100%

A special analysis of inbound intercoastal cargo only, handled during the same period, shows the following segregation:

Cargo tonnage moved by truck from open wharf	22.8%	
Cargo tonnage moved by truck from shed floor and loading platforms	30.8%	
		53.6%
Cargo tonnage moved by rail on open cars from shipside tracks	13.9%	
Cargo tonnage moved by rail across wharf without a temporary set-up in transit sheds	19.0%	
Cargo tonnage moved by rail from floor of shed via rear platform	13.5%	46.4%
Total		100. %

These figures verify conclusions reached relative to percentages of total truck and rail business, also percentages handled across the loading platforms at rear and ends of sheds by both methods. It will be noted



Plan of proposed track and shed arrangement on earth filled pier, berths 228-230, Port of Los Angeles.

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*Paper read before the Convention of Pacific Coast Association of Port Authorities, July 21, 22, 23, 1927, Vancouver, B.C.

that the percentage of inbound intercoastal cargo moved by truck is 54 per cent, while approximately 20 per cent of coastwise tonnage is handled by truck and 80 per cent by rail, due principally to the fact that all coastwise freight rates call for delivery at Los Angeles and existing contracts between the coastwise steamship companies and the Pacific Electric Railway Company provide for rail transportation.

The tabulation also indicates that 12 to 14 per cent of cargo is moved by rail from shipside tracks, while 28 to 32 per cent is moved by rail from the rear platforms of sheds. Considering truck tonnage, the above analysis lists the percentage of all inbound cargo handled from the shed floor as 30.8 per cent and 48 5 per cent of all cargo moved in and out through shed. Approximately 22.8 per cent of the cargo tonnage is handled by truck from the open wharf.

Probable Increase in Truck Traffic

To just what extent the percentage of truck traffic will increase is a debatable question. The factors tending to increase the percentage in southern California are:

First: An equable climate permits uninterrupted use of the highways by motor truck at all periods of the year.

Second: Additional units of a well designed system of highways are being constructed from time to time, making Los Angeles harbor their objective.

Third: The efficiency of the motor vehicle as a cargo carrier is steadily increasing.

Fourth: Industrial expansion is taking place within economical trucking distance of Los Angeles harbor.

Fifth: Increased regulation of trucking concerns by public authorities will be exercised, with consequent increased responsibility on the part of these carriers.

Sixth: Improvements are being installed at terminals which will expedite the loading of motor vehicles.

The factors tending to decrease the percentage of trucking traffic, to the benefit of rail traffic, are as follows:

First: Contributory territory or back country served by Los Angeles harbor is constantly enlarging in area, with attendant expansion of trade which, in turn, increases tonnage originating beyond economical trucking limits.

Second: Unification of rail facilities within the Los Angeles harbor district, now approaching consummation by railroads and port authorities, will result in a reduction of rail handling charges now in effect.

Third: At present some discrimination against rail traffic exists, in that a portion of the switching charges on railroad cars is allotted to the city, as a return on investment in the municipal rail facilities at the terminals. On the other hand, no charge is made for the use of corresponding terminal facilities built expressly for the use of motor trucks. A change in this situation is now contemplated.

Fourth: The staff of the Port of Los Angeles is now studying the cost of facilities and improvements which directly serve and benefit truck traffic at the port. These facilities include through highways, paved depressed areas on terminals and loading platforms. This study is being made to determine the percentage of cost of facilities directly benefiting truck traffic, with a view to affixing a reasonable charge against this traffic, thus placing this business on approximately the same basis as the railroad companies.

The probability of any great additional increase in the percentage of trucking business at the Port of Los Angeles seems remote, and it is now thought safe to design the average terminal facility for Los Angeles harbor with the view to handling approximately 60 per cent of all foreign and intercoastal cargo and 20 per cent of all coastwise cargo by truck.

Terminal Design

Until recently the necessity for making more than ordinary provision for the motor truck was not of great importance, and shipping terminals were designed with little attention given the matter of providing easy access for the motor vehicle to the loading points where its load could be transferred most economically. The majority of terminals in the older ports provide no truck facilities other than entrance to the main floor of the transit sheds, and cargo is, of necessity, lifted three and one-half feet from the shed floor to the bed of the truck. The older pier and wharf designs at Los Angeles harbor were given but little more attention in this direction and only provided a small amount of depressed platform space at the extreme ends of the sheds in addition to the ramps which afforded access to the main floor of the shed. More recently and before the growth of the trucking traffic became so prominent that it demanded attention, the entire rear platform of the transit sheds was paralleled with three loading tracks, and one outside service track, with no provision for motor trucks, except a few areas or loading zones paved with decomposed granite, which were placed across the tracks from the street to the loading platform at intervals. These loading zones were used at the same hours as were rail facilities and it was necessary to divide the cuts of loaded railroad cars into small units and permit the loading trucks to stand parked across the tracks between each cut of cars. This layout and method of operation resulted, very frequently, in ill-timed movements of railway cars and forced groups of trucks and men into idleness for the period required to clear the tracks of cars and make replacements.

Again, the loading of railway cars on the old paralleled track arrangement was accomplished at some disadvantage as the main crossover with slip switches, located midway between berths, required so much room that the car standing capacity was necessarily very much reduced. If movement was effected otherwise, the standing cars serving the inner berth were disturbed whenever cars were moved to or from the outer berth, resulting in loss of time for all labor aboard the disturbed cars.

The Port of Houston, Texas, recognized the value of separating rail traffic at different berths to prevent car movements at one berth disturbing operations at the adjacent berth, and accordingly developed terminals with such separation as their objective. The plan consists of sheds and loading platforms, trapezoidal in shape, which results in a saw-tooth arrangement along the rear platform. There are three loading tracks opposite each berth, and a running track which provides undisturbed access to any berth. No provision, however, is made for special accommodation of truck traffic or for its segregation from rail traffic. There is also a question in connection with this plan as to whether the widening of the transit sheds to conform to the saw-tooth arrangement of depressed trackage is economically feasible where trussed roofs are used, on account of the special and expensive design entailed in providing for different truss lengths.

The Port of Los Angeles is now completing an earth-filled pier at Berths 228 and 230. In making the layout for this terminal, an attempt has been made to solve most of the problems presented by the unusual relation of truck and rail traffic existing at this port. The pier is 460 feet in width, approximately 1100 feet long, and is surrounded by a concrete wharf and a creosoted timber apron. The usual two shipside tracks are provided, as well as two transit sheds 120 feet wide by approximately 1000 feet in length, with loading platforms in the rear. There are two berths opposite each transit shed and one berth at outer end of pier, as well as an additional berth at the end of each slip.

A saw-tooth arrangement has been provided in the construction of the rear platforms, with tracks planned to conform, which permit the clearing of all the tracks in the loading zone of either berth without any interference whatever with cars occupying space to the rear of the adjacent berth. Cars on any single piece of track can, with one exception, be switched to or from position without movements on the adjacent track. All available platform space is convenient for use without interruption from the necessary and logical movements of traffic. The loading tracks and all paved approaches and roadways in the rear of the sheds are depressed approximately three feet, eight inches below the elevation of platforms, thus permitting movement of freight from shed floor to bed of the truck or car on the same level.

It will be of interest to know that the Los Angeles harbor authorities have established a policy requiring all truck loading to be performed outside of the transit shed, or, in other words, all trucks shall be loaded or unloaded at the loading platforms at the rear and ends of sheds. Of course, there are special cases where this general rule is not adhered to, due to the fact that some of the older terminals were not provided with modern loading facilities.

Truck loading areas in the rear of sheds are paved across the tracks, but railroad cars can be so located as to reserve two truck loading zones opposite each transit shed, which would not conflict in any way with the movement of cars. Tracks extend across and terminate at these truck loading zones to provide the maximum amount of car loading space when this service is exclusively required. When entire shipments are to be handled by motor truck, there are semi-permanent paved areas across the tracks which can be used. These, of course, would cause interference with rail traffic and for that reason their operation is placed under the control of the wharfinger on duty at the terminal and they are used only when necessity demands.

The total maximum car loading capacity at any one time on the pier referred to is 106 cars, compared with a possible 110 cars on the former type of layout on a pier of the same size, or only four cars less than was formerly possible. The maximum truck loading capacity on the pier at any one time is 77 trucks, and this maximum would only be reached at such times as the great bulk of cargo would be handled by truck. Under normal operation, the capacity would be 80 railroad cars and 62 trucks.

At the time this layout was made, it was estimated that 50 per cent of the cargo passing over the loading platforms would be to or from motor trucks and 50 per cent to or from railway cars. The figure of 50 per cent now appears to have increased somewhat, but the factors governing the length of time required to load a truck or a railway car are so variable that the design is believed flexible enough to care for any probable fluctuation in traffic requirements.

The pier as designed has one recognized fault. Its width does not allow enough street room. The street should be approximately 20 feet wider and consequently the pier should be a total of 480 feet in width instead of 460 feet. In this particular instance, however, the layout of other existing piers in the vicinity was such that additional width could only be obtained at the expense of narrowing an adjoining slip to an undesirable extent.

As the problem of making adequate provision for suitable motor truck facilities at shipping terminals has already or will shortly appear at most all ports of consequence, the writer has deemed the subject of interest to port authorities and terminal engineers and has, therefore, endeavored to herein outline the efforts Los Angeles harbor has made to effect a solution of this problem.

An interesting aerial view showing part of the inner harbor, Port of Los Angeles, California. At this southern port, truck transportation is responsible for a greater volume of terminal freight than is rail transportation.

The Port of Alexandria

By Roy S. MacElwee

Commissioner of Port Development, City of Charleston, South Carolina.
(United States Delegate to the Fourteenth International Navigation Congress, Cairo, Egypt, 1926)

THE Port of Alexandria, Egypt, the third in importance in the Mediterranean (after Marseilles and Genoa), is the gateway for 95 to 99 per cent of the flourishing commerce of Egypt and the Sudan. Its average annual turnover is about $500,000,000, divided in the ratio of about 60 per cent exports and 40 per cent imports. Alexandria is a thoroughly modern and well equipped commercial seaport where vessels drawing as much as 30 feet lie alongside the quays to load or discharge.

Alexandria is situated on a peninsula extending at right angles from a long low shore line separated from the mainland by Lake Maryut, a typical North Africa lagoon salt lake of a depth of approximately six feet. The peninsula Ras El Tin branches to the east to Fort Kait Bey and to the west to the Point Ras El Tin. This western branch afforded a natural shelter together with the continuation of the branch in the form of a bar or ridge extending to the Island Abbou Baka and other points for a distance of 6.2 miles. This isthmus is approximately 2203 feet wide and 1.87 miles long.

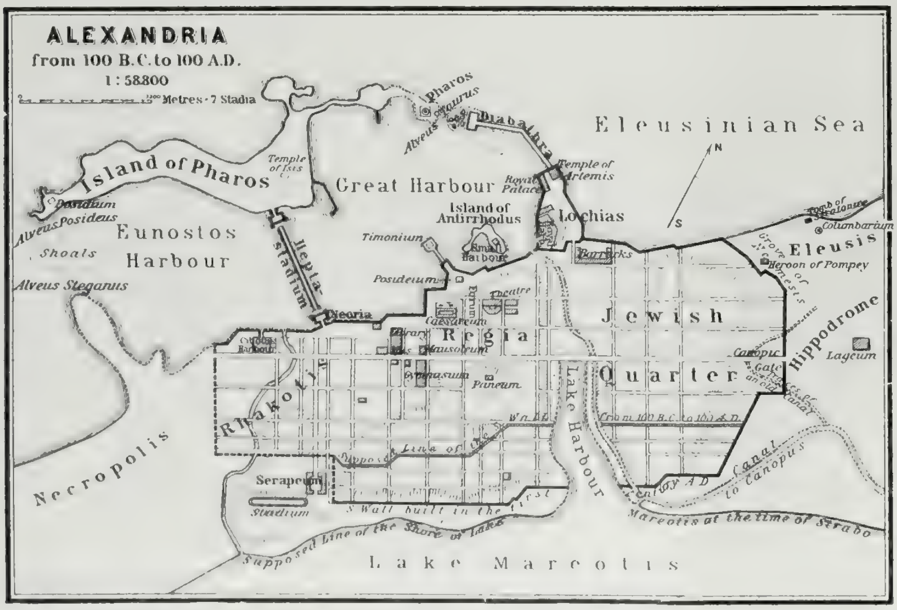
Pharos Island, the outer part of the present Ras El Tin peninsula, was mentioned by Homer in the Fourth Book of the Odyssey. Menelaus, speaking to Telemachus said: “That island has a great harbor. The gods kept me there twenty days.”

Types of Nile boats that distribute freight from Alexandria through the valley of the Nile. (Photo by Author)

There is considerable discussion concerning the authenticity of various harbor works of ancient times that have been discovered near Pharos Island (Ras El Tin). It is maintained that the ancient Ras El Tin breakwater is 1¼ miles long and 200 to 300 feet total width. Alexander the Great recognized the importance of the port and improved the harbor. His works were followed by those of Ptolmey I Soter, who constructed a causeway seven stadia long (4290 feet), the Heptastadia, built from the mainland over to Pharos Island. This Heptastadia caused the foundation of the present Ras El Tin peninsula through the gradual filling in of sand.

The first Lighthouse

Ptolemy II Philadelphus, as an aid to navigation, had Sostratus of Cnide erect a magnificent tower bearing fire at night at the eastern end of Pharos Island. At that time the east harbor was the more important. This lighthouse, associated with the name of the Island Pharos, has given the French name Phare for all lighthouses to this day.



The Port of Alexandria at the beginning of the Christian Era.
(Reproduced from Baedecker's Egypt)

From antiquity to Napoleon the Port of Alexandria fell from glory and at the time of Napoleon's Egyptian campaign the population numbered hardly five thousand. During the rule of Mohamed Ali this strong monarch began in 1835-1840 the Arsenal Basin on the left side of the waist of the Ras El Tin peninsula.

The creation of the commercial port was begun in 1869 by Ismail and placed under an international commission. The principal work of this commission was the construction of a breakwater 2340 meters (7600 feet) westward along the reef from Ras El Tin to the small island off Abbou Baka, and an interior jetty of 1020 meters (3356 feet), forming a shelter for the inner port. The old breakwater was eventually extended to 2900 meters (about 9444 feet) leaving a harbor area of approximately 750 hectare (1853 acres) and 10 kilometers (6.2 miles) long, including the inner basin and 3 kilometers (1.92 miles) wide at the widest point.

The growth of the port with the rise of Egypt and the constant foreign market for Egyptian cotton made such demands on the facilities of the port that it was not long until the inner port or commercial basin had its capacity exceeded by this press of commerce. The old breakwater was widened to form a coal quay and then extended in an awkward arm to the left enclosing a coal basin. This particular form was necessary due to the fact that the main outer breakwater is too far away from shipping and the waters in the outer harbor can become very choppy inside the breakwater. In the time when the harbor was built, sailing vessels that anchored in the roads needed room to maneuver; modern commerce is carried on in full powered steam

The arsenal quay, Alexandria inner harbor. Note breasting-off floats.
(Photo by Author)

or motor vessels. Now the breakwater could be brought in closer to shore because a distance of greater than 1 kilometer (⅝ of a mile) usually leaves sufficient room for a high wind to whip up a disagreeable choppy sea that might not be of damage to vessels riding at anchor but would interfere materially with vessels lying alongside quays taking on or discharging cargo.

To meet the increased traffic the nitrate wharf or the great modern lumber wharves to the west of the outer harbor have also been protected by an inner breakwater, and as the port develops, it is to be expected that future construction along the mainland and the outer harbor will require the construction of additional breakwaters close in to protect the quays.

Quays and Wharfs

It must be emphasized here that Alexandria is one of the few Mediterranean ports where most of the vessels lie directly alongside well equipped masonry quays. The practice in the majority of Mediterranean ports is for vessels to lie moored fore and aft at right angles to the wharf and all goods or passengers are lightered or towed ashore. This is true of Port Said, Constantinople, Piraeus, and even to a surprising extent at Marseilles.

The old Arsenal Basin is occupied largely by government operations such as the offices of the Department of Ports and Lighthouses, the mechanical workshops, and the quays of the Khedivial Mail Line. The Arsenal Quays, of modern construction, a modern extension of the south jetty of the Arsenal Basin, is where the principal passenger and fast freight vessels discharge their cargo, such as the Lloyd Triestino, the Royal Rumanian Line, and others. This quay is a substantial series of masonry quays, in the form of a Greek cross. There is one rail line entering the quay and some small transit sheds by the main quay. Berths 14, 15, 20, and 21 are open, that is, simply paved without sheds. This quay has a depth of 33 feet.

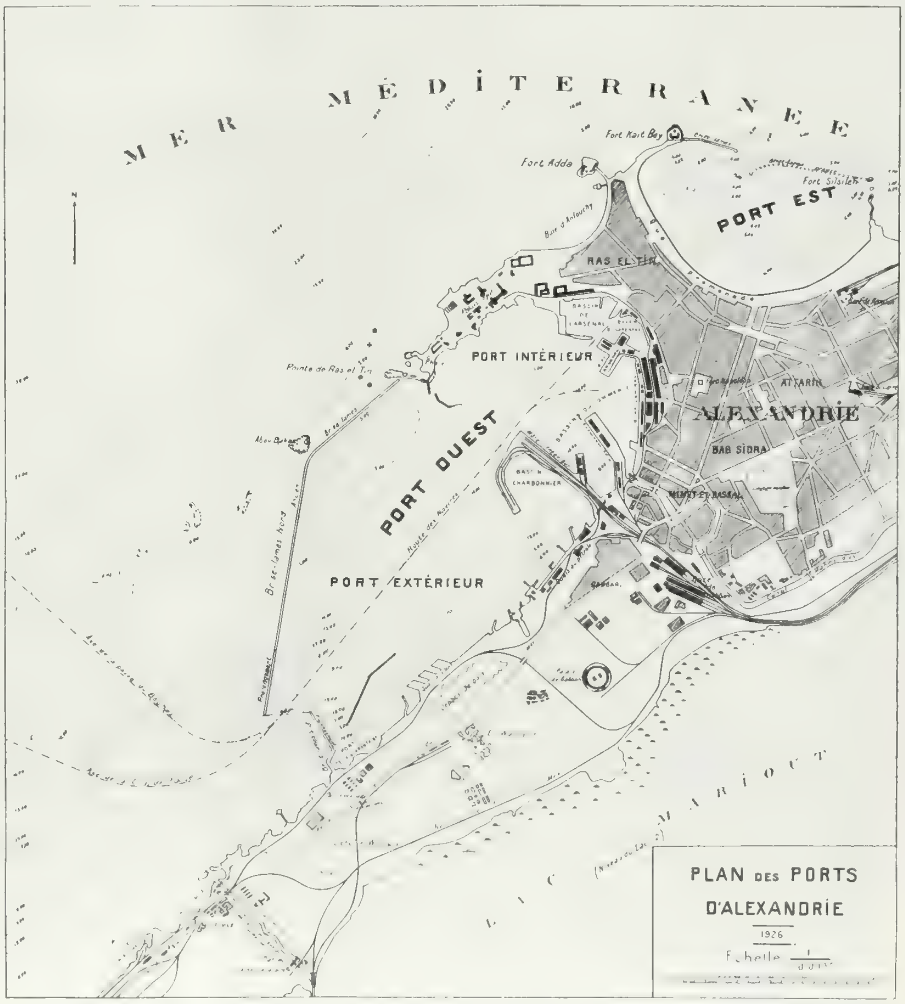
Quay Centrale, a marginal quay, skirting the southeast shore of the inner basin from the Quay de l'Arsenal to the Quay du Mahmoudieh with depths of 24 to 28 feet is the principal cotton exporting quay. It is supported by transit sheds and the great warehouse of the Egyptian Bonded Stores, Inc. This quay is also paralleled by tobacco warehouses and those for general merchandise.

The new quay-pier, the Quay du Mahmoudieh, with 33 feet of water alongside, parallels the entrance to the Mahmoudieh Canal from which it takes its name. It is completely modern in construction. The east quay of this pier is open, without shed. The west quay carries two modern two-story transit sheds, each one served by four electric cranes. These transit sheds, of steel, brick, and masonry construction, are unusual in that the first floor or main quay deck, level has no side walls while the second deck is closed in the customary manner with a wide landing ledge upon which the cranes deposit the merchandise.

Warehouses, Port of Alexandria.
(Photo by Author)

It is interesting that the attempt to use electric cranes on this pier, the first to be equipped with electric cranes in the Port of Alexandria, has been unsuccessful due to the personal element. The crane dues are usually divided between the master and the stevedore, and the master works the ship's winches and the stevedore breaks out or stows the vessel in the usual ship's

(Continued on Page 23, Adv. Section)



Plan of the Port of Alexandria.
(From special report by M. E. Quellennec at the Fourteenth International Education Congress.)

Sixty Years of Steamboating

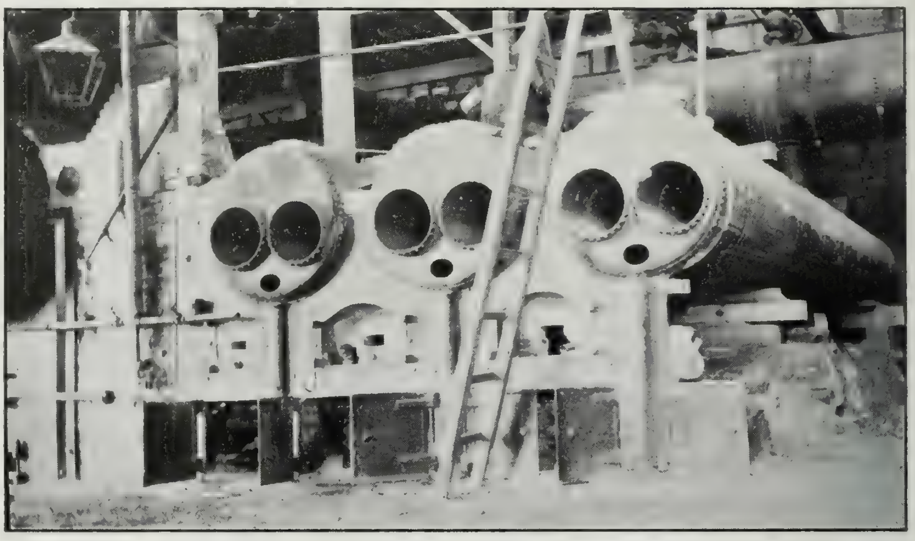
IN 1866 the art of river steamboat building had reached a high stage of perfection as is clearly indicated by the fact that in that year the now famous steamer Robert E. Lee was built. Although there were other excellent steamers, contemporaries of the Robert E. Lee, the fact that she won the notable race from New Orleans to St. Louis, June 30 to July 4, 1870, has made her the most famous river steamer of her time.

The Robert E. Lee had a length of 297 feet, beam 45 feet, and depth of 9 feet. Her propelling equipment consisted of two engines, each having a diameter of 40 inches and a stroke of 10 feet. Steam was produced in the old river type boilers, as shown in the accompanying photograph. Each drum was approximately 42 inches in diameter and 30 feet long, having two 14-inch flues.

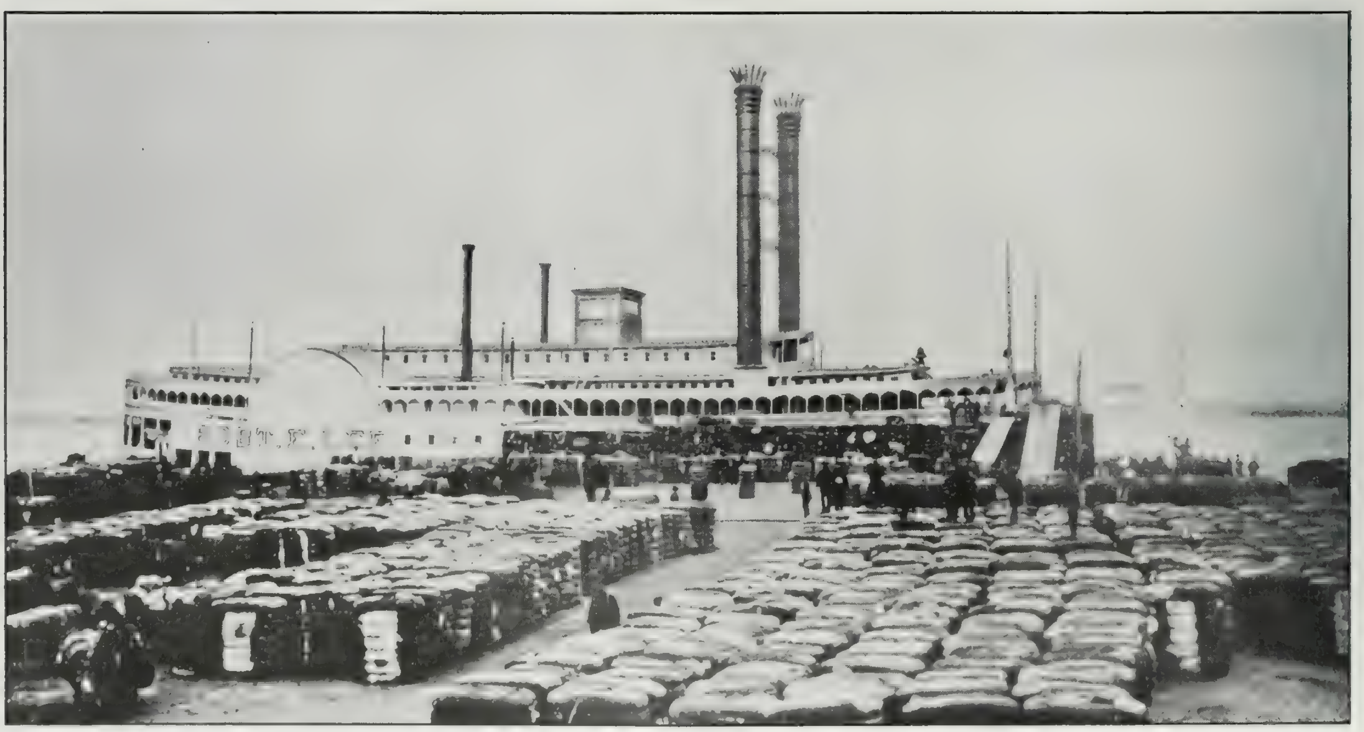
Although these boilers saw severe service on the Robert E. Lee, very high rating being frequently necessary to supply steam to such large engines, it will be of great interest to those studying the length of life of boilers to learn that after the boilers were taken off the steamer in 1882, they were installed at a sugar mill on the Bush Grove Plantation. This is located on Bayou La-Fourche, about two miles west of Raceland, Louisiana, and forty-five miles west of New Orleans. Three of the drums used on the steamer are still in that sugar mill; another drum has been dismantled and is lying outside of the boiler house. A fifth one is being used for an oil tank, and still a sixth is at the Oak Grove Plantation Sugar Refinery, some distance from Raceland, where it also serves as an oil tank. Three more of the boilers are used for liquid storage around the sugar house.

At the sugar mill these boilers were used until about four years ago for generating steam necessary for drying the second sugar, and until eight years ago a steam pressure of 80 pounds per square inch was permitted for them. This was later reduced to 60 pounds, which was carried until the sugar-house was shut down.

With these boilers the Robert E. Lee established herself as one of the most famous river steamers that has ever existed. In 1873 she carried as a single cargo 5741 bales of cotton. This shipment is shown



Boilers of the Robert E. Lee as mounted in a sugar mill near Raceland, Louisiana.

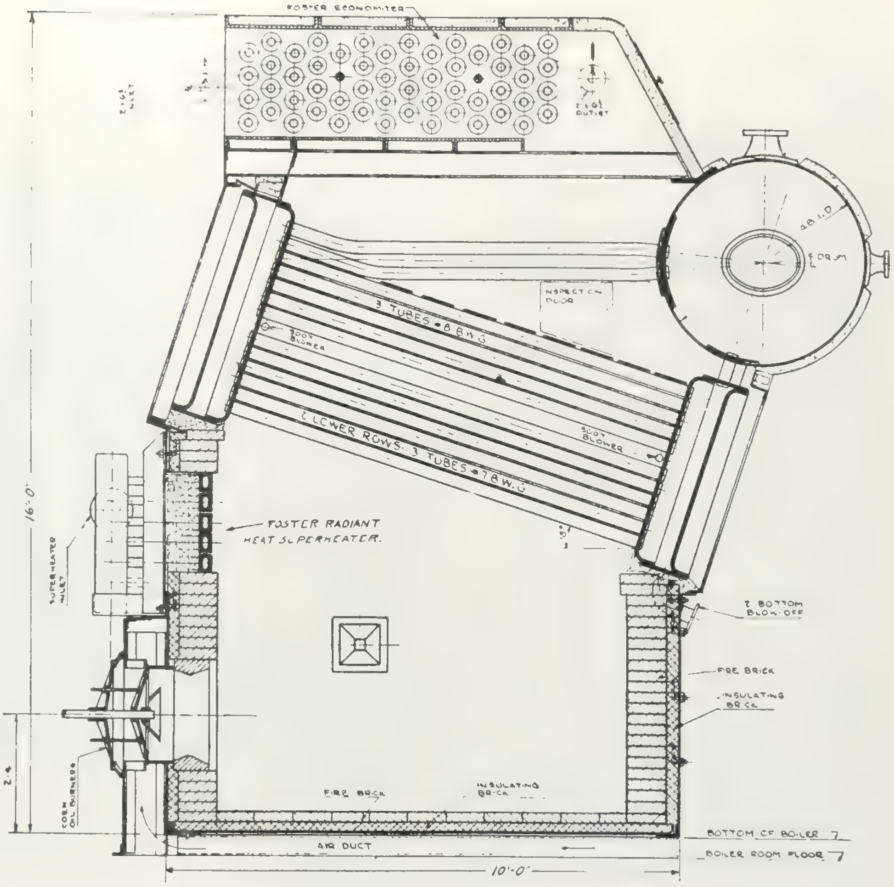


The famous Mississippi River steamer Robert E. Lee and part of her record cargo, 5741 bales of cotton. Picture taken in 1873.

in the process of unloading at New Orleans, and is reproduced from a very old photograph. The speed of the Robert E. Lee, in the three days, 18¼ hours which it took her to run from New Orleans to St. Louis, averaged 16½ miles an hour upstream. Another fast trip was north from New Orleans, 390 miles in 24 hours or 16¼ miles an hour average, including stops. The boilers of the Robert E. Lee were built for high capacity and with little regard for economy. When these boilers were fired with fast burning fuel, such as pine knots, the smoke and flame poured from the stacks. We have no records available of the fuel consumption or efficiency obtained in operation, but it is well known that in those days prime importance was not placed upon fuel economy.

In contrast to the Robert E. Lee is the steamer Sprague, now, by far, the largest sternwheel towboat in the world. The Sprague is 315 feet long, has a beam of 64 feet, and a depth of 7 feet 6 inches. She is driven by two tandem compound engines 28 inches and 65 inches by 12-foot stroke, and her paddlewheel is 37 feet in diameter and 40 feet wide. Steam for the Sprague's engines is furnished by four Foster steam generators at 250 pounds pressure, and her operating conditions are most economical. Her stack temperature is less than 300 degrees, the carbon dioxide is about 12 per cent, and an over-all steam generating efficiency of better than 85 per cent has been shown.

The boilers are fitted with radiant heat superheaters and fuel economizers, which heat the feed water. Although the Sprague is not of the romantic packet class to which the Robert E. Lee belonged, she is, nevertheless, the outstanding steamer on the rivers today. In addition to her world's record for marine steam generating efficiency, her world's record size of paddle wheel and other outstanding features, she has the world's record of having handled the most enormous cargo ever moved as a single unit at any time.



A Foster steam generator equipped with radiant superheat of the type used on the famous Mississippi River sternwheel tug Sprague.

It is not unusual for the Sprague to include in her tow practically a quarter of a million barrels of oil. Such a cargo required an assemblage of oil barges more than 1100 feet long and 260 feet wide lashed tightly together. It is equivalent to 30 trainloads of oil tanks cars or to a single train 10 miles long. The accompanying photograph of the Sprague shows her tied up at the bank and gives a good idea of her size. Her great proportions are appreciated when compared with the men shown in the picture.

(Continued on Page 23, Adv. Section)

The Standard Oil river tug Sprague, largest stern-wheel towboat in the world.

Sumner-Willamette Diesel Engine

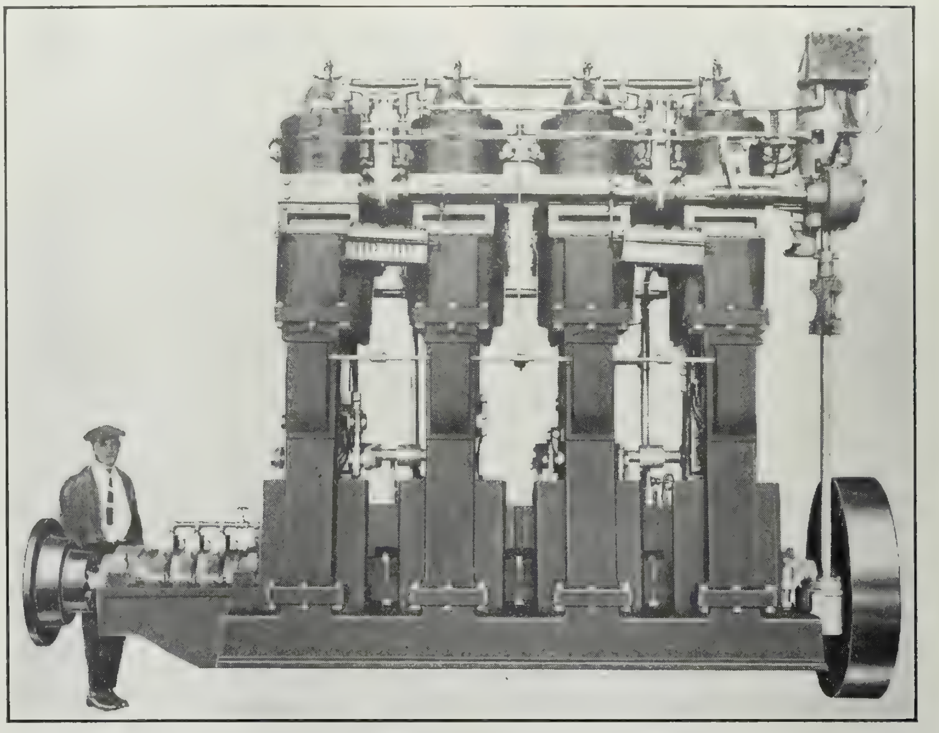
TEN years ago H. W. Sumner designed a diesel engine, the principles of which received such endorsement by engineers that the first pair of engines were sold to Swayne and Hoyt, of San Francisco before they were built. They were installed in the motor schooner Santino. In the next four years twenty-four of these engines, a total of 10 800 S. H. P., were sold and installed in ships that sailed the seven seas. This established the Sumner engine, the manufacture and sale of which has recently been taken over by the Willamette Iron and Steel Works, of Portland, Oregon, so that the engine is now called the "Sumner-Willamette."

The Sumner-Willamette diesel engine is unique from several standpoints. It is an entirely domestic product, having no foreign origin. It was not evolved from any domestic gas or steam engine, but was entirely designed by one engineer working alone—not the product of an organization whose work had been previously concentrated on similar lines.

When Henry W. Sumner designed his diesel engine, the primary idea in his mind was to produce a power plant with which the average marine steam engineer would be able to familiarize himself in the shortest possible space of time. He remembered that years of steam practice had evolved many things in connection with marine work which were just as applicable to a marine oil engine as to a triple expansion steam engine. Thus, in appearance, the Sumner-Willamette diesel will be seen to be much like a marine steam engine.

The Sumner-Willamette is a 2-cycle, crosshead, vertical, open column marine engine, planned to comprehend cylinder combinations from 4 to 8. It is designed to work on diesel fuel oil ranging in gravity from 23 to 28 degrees Baume.

The open column construction—one of the engine's most striking features—is a great advantage from the point of accessibility. The enclosed type of large 2-cycle engine draws its combustion air first into the crank chamber, which is used as an air receiver, necessitating the enclosing of all working parts. The Sumner-Willamette engine draws the air into a receiver which is the cross-head or back column and avoids the necessity of enclosing the working parts. Next to the accessibility of all bearings, the Sumner feature that is outstanding is the combustion system. Scavenger pumps provide an excess of air for scavenging the cylinders of burnt gases, permitting a full cylinder of pure air for the combustion.


A 4-cylinder Sumner-Willamette marine diesel.

Ignition is, of course, by compression, and the engine starts cold without the aid of any igniting apparatus.

Lubrication is forced to the cylinders and bearings. Unions are fitted where necessary, so that the oil pipes may be taken down and cleaned. In general, all the oil for the moving parts of the engine is supplied, as far as possible, from forced feed lubrication.

These engines reverse as easily and rapidly as steam engines.

On the Sumner-Willamette, all auxiliaries, the scavenging pumps, the air compressors, the water circulators, and the bilge pumps are beam driven instead of eccentric driven. Beam drives do not run dry of oil quickly or stick and crack open like eccentrics, and are quieter.

Extreme simplicity and open construction cause upkeep and maintenance charges to be astonishingly low. The vital parts, such as crankshaft, main bearings, crossheads, rods, etc., are all open and in plain view of the operating engineer, who may constantly observe these parts and anticipate trouble.

A thorough study of the principles so successfully incorporated in the Sumner-Willamette diesel will convince all thinking engineers and owners of the merits of this engine.

While this engine has been developed primarily for marine purposes, it is adapted to stationary uses without losing any of its valuable features. The Willamette Company is prepared to supply engines for both marine and stationary purposes.

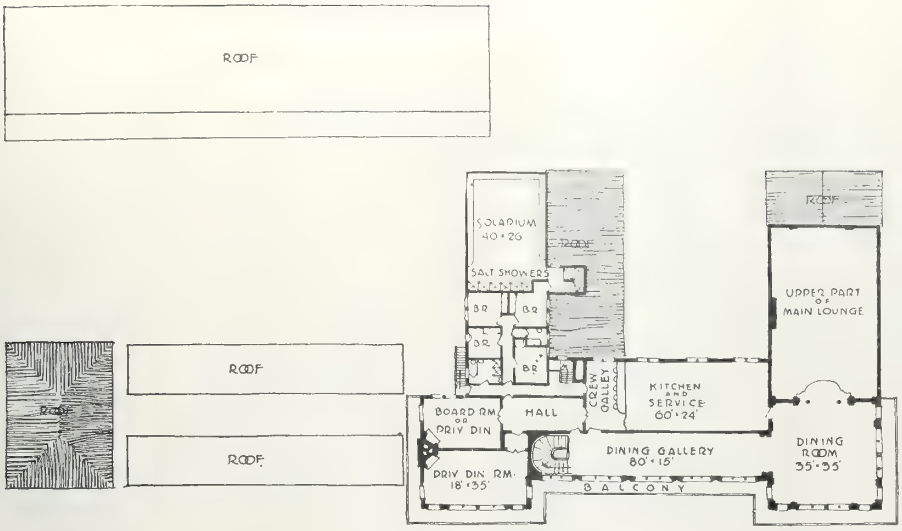
FRANCE PACKING.

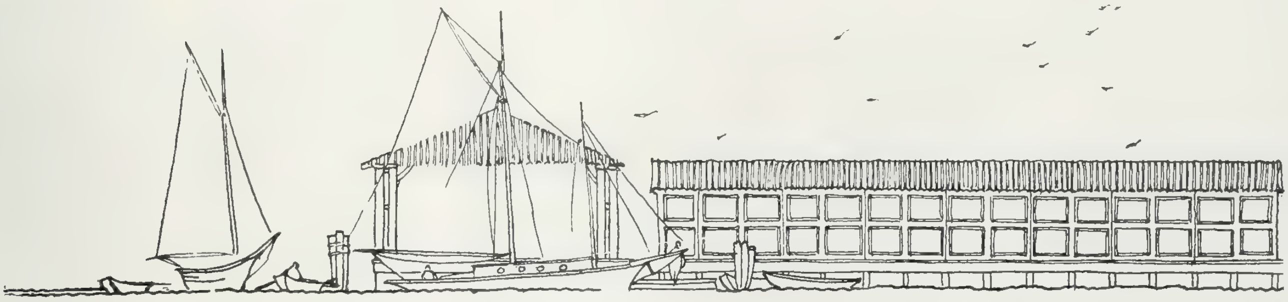
The president of the France Packing Company of Philadelphia, A. W. France, arrived in San Francisco Wednesday, August 31, on a combined pleasure and business trip which will cover the Pacific Coast.

While in San Francisco, Mr. France is the guest of C. E. Rhodes, president of the C. E. Rhodes Company, California distributor for France Packing Company products. Mr. France is delighted with the phenomenal progress of California in commerce and industry and much impressed with the future opportunities for growth in sales of high quality metallic packing.

St. Francis Yacht Club

San Francisco

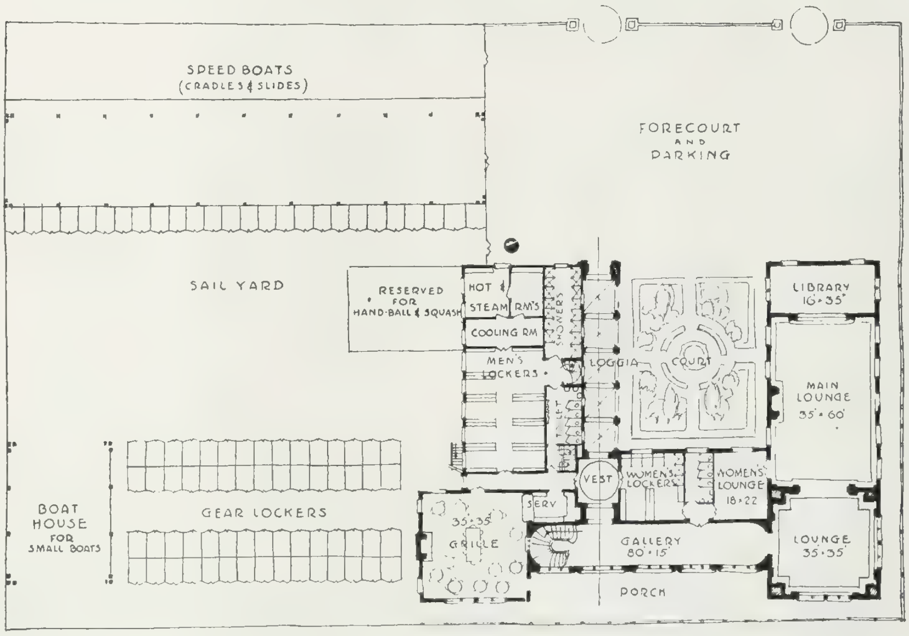


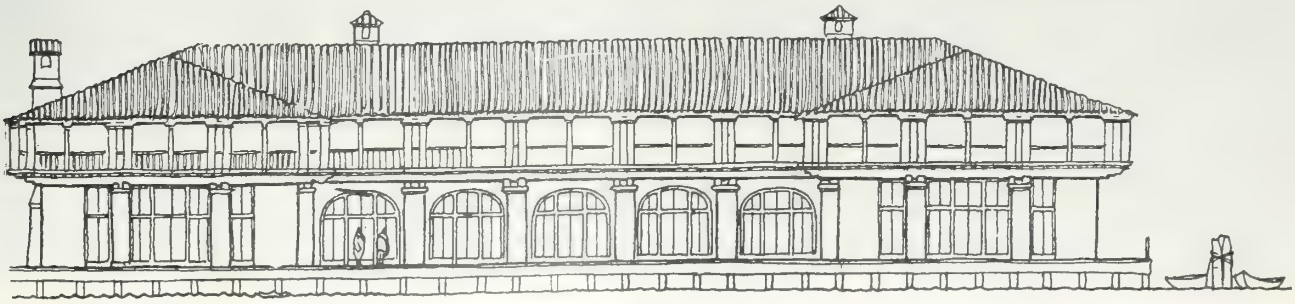


Illustrations on this page show plans for the new building to be erected on the Marina at San Francisco by the new St. Francis Yacht Club. A location has been secured from the Board of State Harbor Commissioners and work is going forward on the wharf and site for the building. This location is adjacent to the new marine playground and yacht harbor now under construction by the San Francisco Park Commission.

The St. Francis Yacht Club has enrolled seventy or more members and is gaining new members every day. The quality of the charter membership of this club insures that it will be well conducted and its quarters be maintained in a manner creditable to the City of St. Francis.

At the top is shown the plan of the upper story of the main clubhouse. Below it, the east half of the north front, the first floor plan of the buildings, and the west half of the north front.

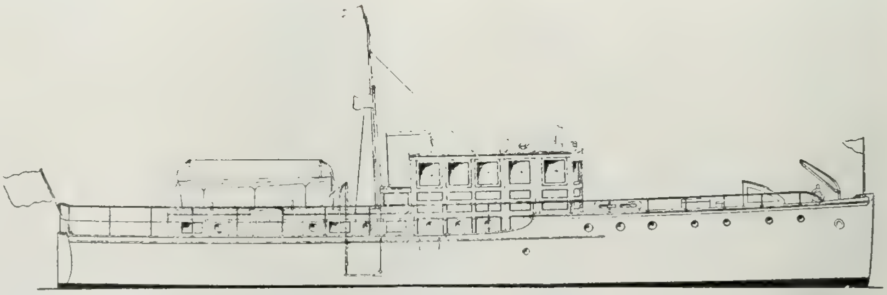




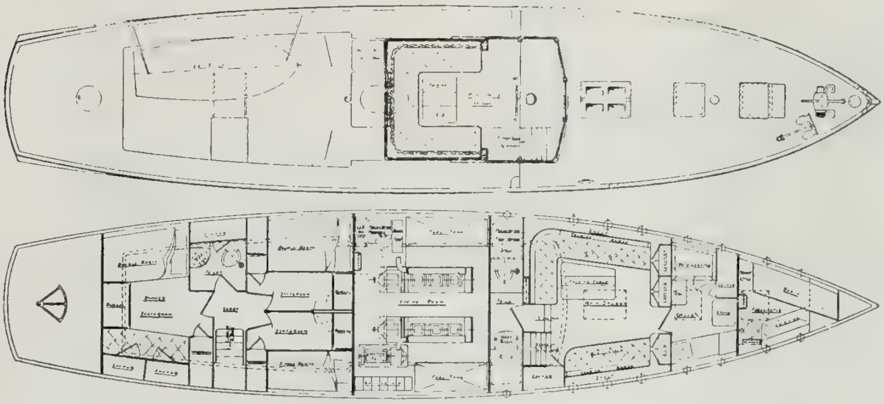
Pacific Workboats and Their Power Plants

Standardized Express Cruiser

THE first of a series of standardized cruisers was recently completed at the yard of Madden & Lewis, shipbuilders of Sausalito, California. These cruisers, the plans of which we publish herewith, were designed expressly to meet the demand for fast seaworthy boats for yachtsmen whose experience taught that certain desirable features are essential in modern yachts. Noteworthy among these are the five water-tight compartments.



Above, outboard profile and, below, general arrangement plans of the Mogul.



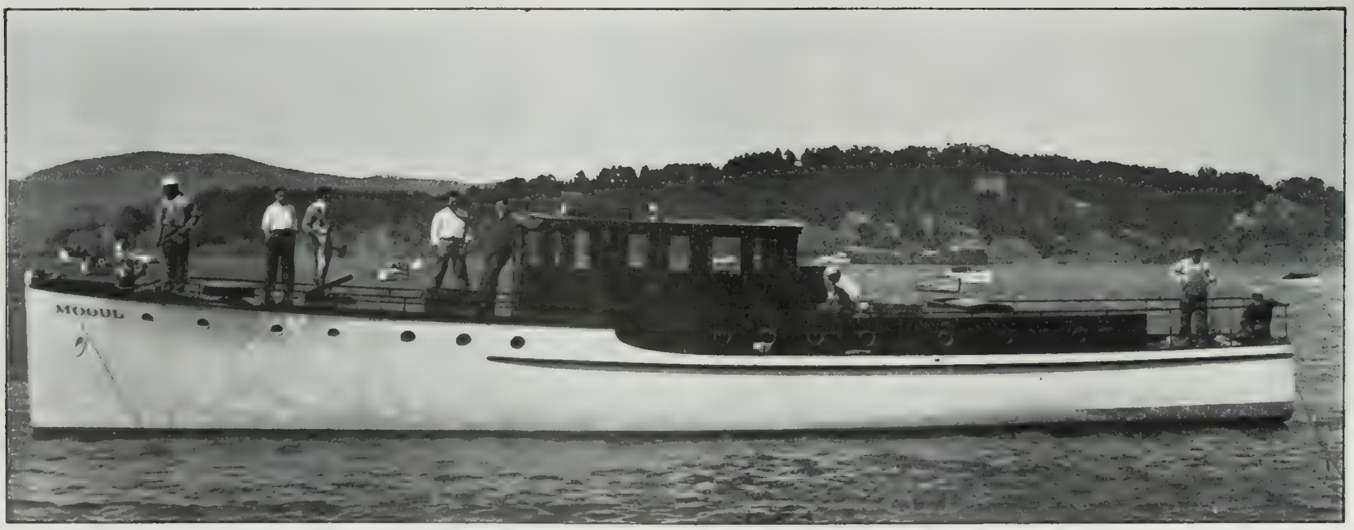
Lee & Brinton, naval architects of San Francisco and Seattle, were entrusted with the design, and the result shows an unusual amount of strength has been embodied in a hull of light draft.

The length is 64 feet, beam 13 feet 10 inches, and draft 4 feet The keel is one piece Douglas fir with iron bark shoe. Ribs are of Eastern white bending oak, 2-inch by 2-inch, spaced 10-inch centers generally but are doubled in the way of the engine room. Planking is 1¼-inch vertical grained Douglas fir. This lumber has been very carefully selected and shows no blemishes anywhere. All the decks, pilot house, superstructure aft, and rail capping are of teak.

The main power plant consists of two 6-cylinder, 225-horsepower Sterling Dolphin engines driving Hyde propellers. The electrical generator is the Universal Products Company (Uptco) 2½-kilowatt, 110-volt, direct current, installed at the after end of the starboard main engine. The electric pump for bilge and fire purposes was supplied by Westco Chippewa. This pump is capable of throwing a jet of water 75 feet high. The water pressure system is Westco Chippewa and is electrically driven automatically controlled. The storage batteries are heavy plate Willard. Gasoline tanks having a capacity of 600 gallons are installed on each side of the engine room. These will give a large radius of action at normal cruising speed.

As it will be necessary, under normal conditions, to carry only one hand aboard this particular boat, the forecastle has ample accommodation for one paid hand.

A water-tight bulkhead at the after end of the forecastle forms



View of the Mogul in the water opposite Sausalito, California.

the forward end of the galley. This on the port side has a large ice box, the temperature of which is controlled by an electrically operated Copeland refrigerator. A noteworthy feature of the boat is the cooking range. This has all the advantages of those found in better homes. It is a lid top Spark gas stove, manufactured by the Hammer-Bray Company, and the gas is in the form of a liquid stored in containers, the whole being a product of the Rock Gas Company. An instantaneous heater works off this system, giving hot water at any hour. On the starboard side a large drain board is fitted with sink having hot and cold water leads.

The forward saloon, as will be noted on plans, is very spacious for a boat of this size. Trimmed with teak, it is designed to comfortably accommodate a large party, and it gives an impression of being aboard a large yacht. The joiner work, lockers, and cupboards are all of teak, and the whole effect has a richness seldom found on boats of this type. The backs of the settees are so arranged that they may be swung up, forming comfortable additional berths to the lower. Close on center line, a step-down at the after end leads to a toilet room. At the side of this a stairway leads to the pilot house.

On the port side of the after deck, a companion gives access to the staterooms. That of the owner at the stern has two large double berths with a large bureau between. At the forward end to starboard there is a large hanging locker. The trim in the owner's stateroom is teak and white enamel and this, with plenty of lights and mirrors, makes a most agreeable and airy room. The forward part of this section of the boat is divided into two staterooms. That on the starboard side has a single berth, while that on the port has a large double berth. It will be noted, however, that these two rooms are separated by a sliding door which, on being pushed back, forms one large stateroom. Each stateroom has the individual teak dresser and large hanging locker. The trim in both these rooms is similar to that in the owner's cabin. Entered from the lobby, there is an adequate toilet room.

One of the distinctive features of this boat is the large pilot house saloon. This is built of solid teak throughout. Entrance is by sliding doors on either side. An Erico Kainer steerer is fitted on the raised platform at the forward end, and all engine controls are brought to this point convenient to the helmsman. The height of settees is arranged so that a person when seated may have a clear view all around. When necessary two guests may have comfortable sleeping quarters in this pilot house.

Above, Madden's yard, Sausalito, with various craft on the ways. Below, the cruiser Mogul on the ways just before launching.

The cruising speed will be approximately 16 miles per hour, and a maximum of 20 miles per hour is anticipated. The windlass is the American Engineering Company's 110-volt electrical set which will handle one 75-pound service anchor and one 150-pound stern anchor. All fittings throughout are of solid brass, and the interior fittings are nickel plated. This boat is heated throughout by Majestic electric heaters manufactured by the Majestic Appliance Company.

The first yacht of the series has been purchased by M. C. Mogensen, well-known motorboat enthusiast of San Francisco, and who flies the burgee of the Corinthian Yacht Club. He has shown keen interest in this boat from the start.

TRADE LITERATURE

Chas. Cory & Son, Inc., of 185 Varick street, New York, and principal cities, announce the distribution of the third edition of its **Hose Bulletin.**

The new 12-page bulletin, No. 201-29-C contains illustrations, data, and descriptions of seamless flexible metal hose for use as a flexible conveyance of non-solids and non-abrasives. The principal feature being a seamless leak-proof construction, the use of the hose is not limited to ordinary conditions but also includes applications for flexing and expansion at moderate and very high pressures and temperatures and will, properly installed, remove destructive vibration.

The new water supply system at Tampa, Florida, was recently described and illustrated in an elaborate paper presented by Nicholas S. Hill, Jr., consulting engineer, before the New England Water Works Association.

The paper has been reprinted and is being distributed by the **De Laval Steam Turbine Co.**

Victoria Boatyard Notes

Victoria, British Columbia, was one of the first ports on the Pacific Coast to have a power boat. The steamer Beaver, built in England and owned by the Hudson Bay Company, entered Victoria Harbor in 1836. At that time she was considered an ocean steamer and in a way deserved the title, having steamed around the Horn. But as she was only 101 feet long and had but 20 nominal horsepower, she would hardly compare with the everyday workboats now plying in the Straits of San Juca de Fuca from Victoria wharves. The Strath, built by the Turpel Marine Railway Company, with her 85 feet length and 280 horsepower diesels, would run rings around the old Beaver and probably tow her stern first at several knots per hour.

Both steam and diesel power are employed in the fleet which today operates from Victoria as headquarters. A fine example of the former is the tug Burrard Chief, owned by the Island Tug & Barge Co. This vessel was built a few years ago at Vancouver and has been one of the most successful tugs of her class in British Columbia waters. She holds prizes and a silver plaque awarded for speed, efficiency, power, and skill of crew. She is equipped with wireless telephone system on a 200 meter wave length and can keep in touch with the head office at all times. Her engines are compound, with cylinders 12 inches and 26 inches, fore and aft, with a stroke of 18 inches. A Scotch marine boiler, oil fired, gives plenty of good dry steam to generate 300 horsepower.

The Island Tug & Barge Co., Ltd., of Victoria, is a corporation doing an extensive business in workboat and sea traffic activities. Harold Elworthy is managing director and knows the game well, having been brought up on the waters adjacent to Vancouver Island. His company operates eight workboats and forty barges of from 100 to 700 tons capacity. Six of the tugs are steam powered and two are diesel powered. Of these latter one has a Kromhaut and the other a Kahelberg semi-diesel engine. It is the intention of the firm to dieselize their fleet when renewals become necessary.

The Victoria Tug Company, Ltd., of Victoria, of which Captain George McGregor is managing director, operates four heavy workboats, the largest of which, the Strath, has diesel engines of 280 horsepower and is a very able seagoing craft. This firm christens all its vessels with names beginning with "S." They own the Strath, Spray, Swell, and Sadie, tugs, and barges Sadie No. 1 to No. 22, of capacities from 300 to 600 tons. Business has been very good with them the past year, and if it increases to any extent additions to the fleet will have to be made.

The Hafer Machine Co., Ltd., Victoria, is managed by Thomas Walker, his son, C. R. Walker being secretary of the company. They operate a very busy and well equipped machine shop and handle all classes of new work and repairs. Forging and Oxy-acetylene welding of any sort is done, specializing in marine work. Business is reported good with them. In connection with the shop they operate a large store with heavy stocks of steel bars and plates, valves, sheet brass, piping, and fittings.

The Victoria Machinery Depot Co., Ltd., report that they have been kept busy on repair jobs of various kinds on large and small vessels. The fish oil industry has of late given them quite a run of work on the building of tanks, of which the yard makes a specialty. The marine ways are also occupied most of the time, vessels of the coasting class using them for painting and repairs. A crew of seventy men is steadily employed by the firm. They are prepared to take up any line of ship work as it offers.

The Victoria Boat Works, Bay street, Victoria, has a fine water frontage and an easy approach from railroad and trucks. The proprietor is B. Foster, he handling the business which has been established some three years. During that time he has turned out many good sturdy workboats and seiners. In addition to the shipbuilding department, a fully equipped machine shop is operated, where general repairs of all kinds can be attended to. Mr. Foster was a chief engineer in the Canadian naval force during the late war, and besides being a fine metal worker is a boatbuilder and draughtsman. Having practical knowledge of the business, he naturally gives good satisfaction to his customers.

The Murdie-Wood Engineering Works have lately started a general repair shop in the Industrial Reserve at Victoria. The firm is composed of two young men, G. E. Murdie and T. A. Wood, both of them practical mechanics and engineers. Their shop is fitted with modern and efficient tools large enough to handle almost anything coming along, though they cater mostly to the workboat trade. Installation of diesel engines is a specialty with them, and within the past few months they have installed two sets of Washington-Estep diesels and one Fairbanks-Morse. A new and well equipped marine railway, large enough to handle 85-foot seiners and workboats is now being built at this plant.

The ways of the **Turpel Marine Railway Co.,** at Victoria, northern harbor, is one of the oldest in the northwest. The elder Mr. Turpel established the yard many years ago and made a fortune in the building and overhauling of sealing schooners when that industry was at its zenith. With the passing of that branch of shipbuilding, the construction of workboats and barges was taken up, and many of this sort of craft have been built, one of the most notable being the Strath, a big seagoing tug operated by the Victoria Tug Co. A few months ago the founder of the yard passed over to the Great Master Builder, but his son, Samuel, has taken the active control of the yard, where he served for many years under the able tutelage of his father. He reports very good business in the way of barge construction, many of these heavy craft being used in the oil, rock, lumber, and coal carrying trade on the waters of Puget Sound.

Yarrows, Ltd., at Esquimalt, has recently constructed a very fine office building for the use of the executive and office staffs. This building is of stone and brick, 80 feet by 70 feet, one story in height. It has been laid out in a way to give the best efficiency in handling their business. The drafting rooms are very light and lofty, while the offices are so arranged that all matters can be attended to with the least possible delay. The old wooden offices of war-time build will be torn down as soon as transfer to the new building is made. Besides this improvement, the main machine shops have been considerably enlarged, and new tools installed. Yarrows believe that in the shipbuilding business better times are in sight and that it will pay to be ready.

This firm reports a very good run of business on repairs. Their hauling out ways, capable of handling 3000 tons, have been occupied nearly all the time the past few months. When larger tonnage has to be attended to, they have the big government dry-dock available. At this dock (the largest on the Pacific Coast) Yarrows have recently put up a fine and handsomely finished brick workshop, 30 feet by 70 feet, fitted with modern tools and welding outfits. This insures quick repairs of the lighter sort, while heavier jobs can be handled at the main works.

A new 25-ton electric crane has been installed at the big government dry-dock. This is a mobile crane, traveling on tracks completely around the dock. It has a radius of 105 feet, which will permit of landing lifts slightly beyond the center line of the dock. A test was made of it with weights of 28½ tons, and all worked well. A stationary crane with a capacity of 100 tons on a 105-foot radius is being erected at the outer end of the dock for the handling of big guns, boilers, armor plate, and machinery. The addition of these cranes equip the docks for all classes of work. A 15-foot heavy wire mesh fence, with a three foot overhang at top has been constructed to completely enclose the dock and shops, there being but one land entrance. This fence can also be heavily charged with high tension electricity if necessary, making it a strong defense. High officials and executives of the dock will have modern and commodious quarters within the grounds.

Tug Burrard Chief, prize steam workboat of Victoria, B. C.

Powerful Diesel Tugboat for Gulf Ports Service

A SINGLE-SCREW steel diesel tugboat for the International Cement Corporation has recently been completed by Harry A. Marvel of Newburgh, New York. The vessel was designed by Cox & Stevens, consulting naval architects and marine engineers of New York, and is to be used for towing barges between ports on the Gulf of Mexico and adjacent rivers.

The principal dimensions of this tug are:

Length over-all	90′0″
Length on water line	82′0″
Beam molded	21′0″
Depth molded	9′6″
Mean draft	7′0″

The vessel is of steel construction throughout, with the exception of the fenders, the joiner work in main deckhouse, the upper deck, and the upper deckhouse, which are of wood. The hull below the main deck is divided into five compartments by transverse water-tight bulkheads forming fore peak tank, forward hold space, machinery space, aft peak tank, and lazarette. The peak tanks are arranged to carry water ballast and will effectively alter the trim of vessel to meet the various existing draft conditions encountered in service. Fuel oil is carried in independent tanks located in the forward hold.

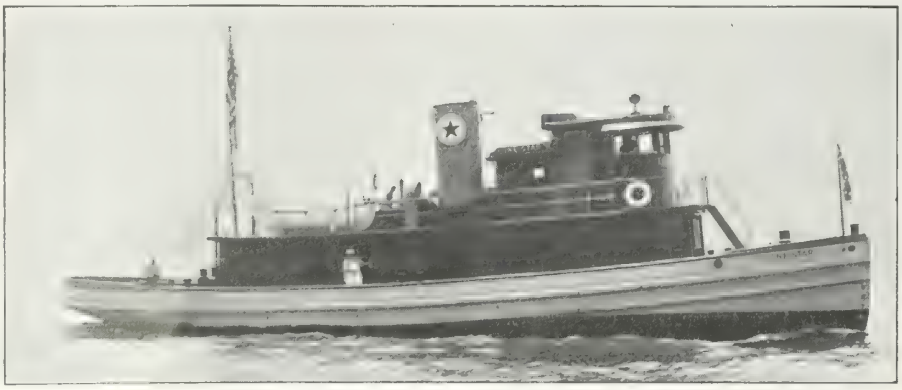
The main deckhouse contains six staterooms, accommodating twelve men, a galley, two mess rooms, engine casing, two toilets, ice box, lamp locker, and store room. The arrangement provides separate accommodations for white and for colored crew. The upper deckhouse contains a raised pilot house and captain's room, accommodating two men.

The steering gear is of the usual manually operated tugboat type with rod and cable transmission between pilot house and quadrant. An American Engineering Company's Type 3-A Gypsy, driven by a 5-horsepower electro dynamic motor, is located on main deck with the motor under deck.

The main engine is a 500-brake horsepower at 235 revolutions per minute Type 6 MIR-22, 6-cylinder, 4-cycle, mechanical injection, direct reversible, Nelseco marine diesel engine, direct connected to propeller shafting.

A Worthington 2-stage, 50 cubic feet displacement air compressor and a Gould 1½-inch suction reciprocating bilge pump are driven off the intermediate line shaft. The auxiliary engine set consists of a 10 to 12 horsepower, 2-cylinder, Palmer gasoline engine, driving through chain, a 5-kilowatt electrodynamic 110-volt direct current generator and direct-connected at one end to a Nelseco 5-cubic feet capacity air compressor and at the other end to a Gould 100-gallons per minute, at 70 pounds pressure, rotary fire and bilge pump.

The emergency electric plant is a Kohler 1500-watt, model D. P., gasoline engine driven 110-volt, direct current generator set.



The diesel tug Lone Star.

Auxiliaries—Ship Supplies—Marine Equipment

Atomic Hydrogen Welding Now Practicable

ATOMIC hydrogen welding—the process by means of which hitherto unweldable metals can be melted and fused without the slightest trace of oxidation, and welding can be performed in some cases on metals as thin as the paper on which this is printed—is now made practicable by the use of equipment placed on the market by the General Electric Company. This process, making possible the welding of many special alloys and the production of ductile welds in iron and steel, is the result of research conducted by Dr. Irving Langmuir of the General Electric research laboratory.

In brief, this method utilizes the passage of a stream of hydrogen through the arc between two electrodes. The heat of the arc breaks up the hydrogen molecules into atoms. These combine again a short distance beyond the arc into molecules of the gas, and in so doing liberate an enormous amount of heat, so that more effective welding temperatures can be obtained than with the usual welding methods.

Since atomic hydrogen is a powerful reducing agent, it reduces any oxides which might otherwise form on the surface of the metal. Alloys containing chromium, aluminum, silicon, or manganese can thus be welded without fluxes and without surface oxidation.

Thorough trials, extending over a period of many months, were made in the General Electric shops before introducing the new equipment. The apparatus, as finally designed, represents the result of continued experimentation and research. The welding outfit consists of (1) a single-phase transformer for converting the voltage of a 60-cycle source of power to one suitable for the welding equipment; (2) a specially designed, variable reactor to provide the proper welding current and voltage for different classes of work; and (3) the welding torch by means of which the actual work of welding is performed.

While the principle of operation is the same as that involved in the design announced by the General Electric research laboratory a year ago, the mechanical and electrical design has been much improved. The torch consists of a holder supporting two tungsten wire electrodes, the electric conductors connecting these electrodes to the reactor and the tubing for the hydrogen gas. Each electrode is supported inside a nozzle through which the hydrogen gas is forced out around the electrode. The combination of electrodes and nozzles is set at an angle and the distance between electrodes, or arc length, and also the flow of gas, are readily adjustable.

The electric conductors to and through the torch are heavily insulated and, when welding ceases, the welding circuit is automatically interrupted until such time as the operator is ready to weld again, when the circuit is automatically restored. In contrast to the usual method of electric arc welding, there is no current flowing from the electrodes to the work to be welded. The circuit is completed from one electrode to the other.

The reactor consists of a U-shaped core provided with pole faces between which a pivoted armature is arranged to move. The legs of the core are provided with coils connected in series with the electrodes of the welding torch. The amount of welding current and voltage is governed by the movable armature which changes the air gap of the magnetic circuit and therefore the reactance. This armature is normally biased to an open position, and, upon a flow of current through the coils of the reactor, is attracted to a closed position that may be determined by means of a handle and a suitable mechanism. When the arc is struck the armature automatically assumes the closed position and remains there until welding ceases, when it automatically resumes the normal position of maximum air gap.

In making edge welds, the metal to be welded is melted under the heat of the arc but, when it is necessary to add additional metal, a filler rod must be used and fed into the arc in much the same manner as is followed in the ordinary gas welding process.

The new equipment is so far being marketed for operation from 60-cycle, single-phase circuits only, and is recommended for use on ordinary metals of less than ¼-inch in thickness, or on hitherto unweldable metals of greater thickness. Metals having a thickness of but 10 mils can easily be welded and little doubt is expressed that, in some cases, work as thin as 2 mils (about the thickness of ordinary writing paper) can be welded.

Because of the absence of oxides and nitrides from the weld made by this process, it is particularly adaptable to the welding of special alloys so far not weldable by other methods, and also makes a strong, smooth and ductile weld on ordinary iron and steel work.

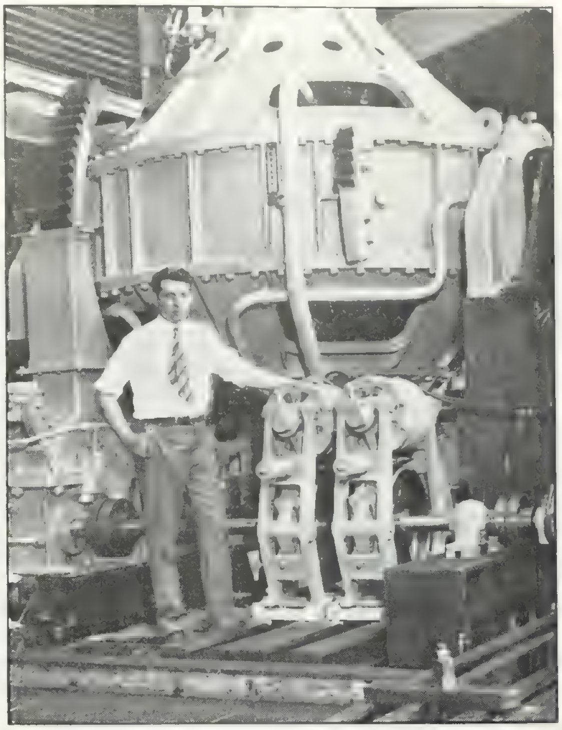
Scotch Marine Boiler Announcement

THE Continental Iron Works with its plant at Calyer and West streets, Brooklyn, one of the oldest established companies of its kind in America, and the largest builder of corrugated furnaces and furnace fronts for the Scotch marine type of boilers, is retiring from active business and is now in the process of dissolution.

The American Welding Company has purchased from the above company the special machinery used in the manufacture of the famous Morison suspension furnaces and Morison patent furnace doors and fronts, and this machinery is now being installed, and will shortly be ready for operation, at their Carbondale plant.

The trade names heretofore used by the Continental Iron Works with reference to Morison suspension furnaces and Morison furnace doors and fronts are now the property of the American Welding Company. In the continuation of the production of furnaces and fronts, a number of the employes of the Continental Iron Works who are experienced in their manufacture will be added to the Carbondale organization.

Gyro-Stabilizer for World's Largest Motor Yacht



Sperry Gyroscopic stabilizer for the new yacht building for Richard M. Cadwalader by The Pusey and Jones Corp.

TESTS were conducted by the engineers of the Sperry Gyroscope Company recently at the South Philadelphia plant of the Westinghouse Electric and Manufacturing Company on the new gyro ship stabilizer building there for the world's largest diesel yacht, which was designed by the well-known firm of naval architects, Henry J. Gielow, Inc., of New York. This stabilizer will be installed in Richard M. Cadwalader's new yacht now building at The Pusey & Jones Corporation, Wilmington, Delaware. The tests were witnessed by H. T. Herr, vice-president of Westinghouse Electric and Manufacturing Company; A. Schein. chief stabilizer engineer of the Sperry Gyroscope Company; Robert B. Lea, assistant sales manager of the Sperry Gyroscope Company; J. Merton Rice, chief engineer for Henry J. Gielow, Inc.; A. M. Main, naval architect, The Pusey & Jones Corporation, as well as numerous others.

During the test, the stabilizer, which is 9 feet high by 10 feet wide, was made to respond to the conditions which it would be put to in bad weather at sea. The rotor was seen to rotate at 1300 revolutions per minute. The stabilizer was precessed fore and aft in its bearings just as it will to counteract the roll of the ship. With this apparatus on board Mr. Cadwalader's yacht, he is going a long way towards prevention of sea-sickness as the stabilizer will insure a calm passage in all weather since the motion of the gyroscope is able to eliminate all disagreeable roll. And conversely it will be possible for the owner to give his guests all the thrills of an ocean voyage while lying at anchor for by merely pressing a switch on the control board, the gyroscope will cause the yacht to roll as in a sea-way.

Mr. Cadwalader's new 2300-ton vessel will be 294 feet over-all, with a beam of 38 feet 3 inches and a draft of 16 feet. Two 1500-horsepower Bessemer engines will drive her at a speed of 16 knots. The oil capacity will provide for a cruising radius of 10,000 miles.

With a size such as this, commodious appointments are possible; for instance, an owner's observation room 18 feet by 18 feet forward and a lounging room 17 feet by 26 feet, and the living room 24 feet by 26 feet. At the after end of the deckhouse is a conservatory 16 feet by 24 feet.

This beautiful yacht will have the advantage of the Sperry Gyroscope Company's other aids to navigation, such as the Gyro compass and Gyro pilot-automatic steering equipment, popularly called Metal Mike. The Gyro ship stabilizer will be mounted in the forward part of the engine room. A special observation platform will be provided where the owner and his guests may sit and view the working of the stabilizer and other engine room equipment. It is interesting that the rotating gyroscope of the stabilizer need only be 8 feet in diameter and weigh 20 tons to completely stabilize this 294-foot vessel displacing 2300 tons.

Encouragement for Air Mail

FOR the double purpose of hastening its mail to the Pacific Coast and western states and of cooperation with the private companies which took over the operation of the air mail line from the United States government on July 1, the Haskelite Manufacturing Corporation of Chicago, large makers of aircraft plywood products, on July 1 began an extensive use of the air mails.

All first class mail to points west of Omaha now goes forward also by air mail. A special letterhead and envelope, printed in two colors, red and blue, the same as the regular air mail envelope, have been prepared for their use. The letterhead and envelope are printed on very thin paper so that a two-page letter, stamped and sealed in its envelope, weighs less than half an ounce, to come within the air mail postage rates of 10 cents a half ounce.

Under the new posting arrangement, all letters for first class mail are written in the regular way, except that the first carbon copy is on the special letterhead. The original is signed in the usual way and sent by train mail, and the carbon copy, on the special letter head and in the special envelope, is sent by air mail, unsigned. Many hours are expected to be saved in this way. On the bottom of the letters sent by regular mail appears the note, "Copy of this letter going forward air mail."

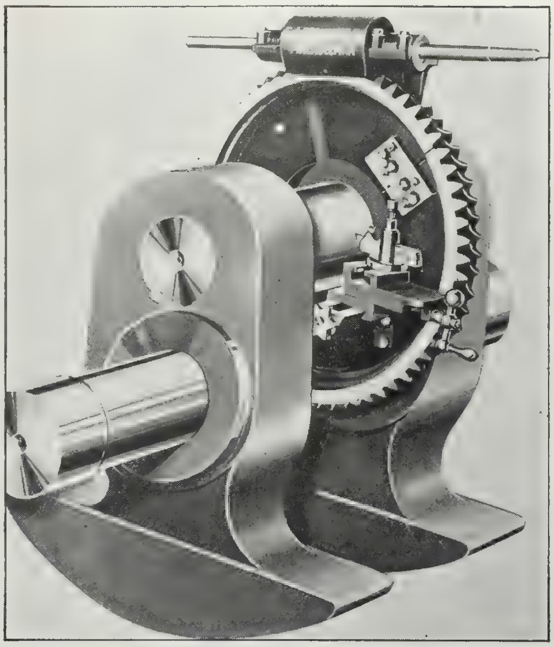
This idea of sending all western mail by air originated with James R. Fitzpatrick, vice-president and secretary of the company, who has handled aircraft sales for the company practically since its organization in 1917.

History of the Incandescent Lamp, by John W. Howell and Henry Schroeder; 208 pages, cloth bound; published by the Macqua Company, Schenectady, New York. Much interesting data have been compiled in this book with many photographs depicting the evolution of the incandescent lamp through the experimental period to the final commercial success, showing its connection with the phenomenal growth of electric light and power industries.

Portable Crank Pin Turner

A NEW portable crank pin turning machine for truing up worn center crank pins has recently been designed and put on the market by E. J. Rooksby & Co.

The machine is illustrated truing up the center crank pin on the center crank axles of the new type 3-cylinder locomotives, but it is equally adaptable to any center crank engine whether steam, gas, or diesel engine, for use either in stationary or marine work.


Rooksby portable crank pin turner.

The illustration shows the front view of the machine, which is composed essentially of a stationary and revolving disc. The revolving disc is supported in the stationary disc by a keeper ring which provides a substantial journal bearing as well as the thrust bearing. The stationary disc is secured to the inside face of the crank cheek by adjusting screws and the studs and clamps.

The revolving disc is driven by a worm gear of ratio suitable for either air drill or electric motor and carries a substantial arm with a slide block and cross-slide having tool post and turning tool, giving a feed both ways on the pin provided by a star feed.

Both of the discs and the keeper ring are, of course, split in order to get the machine over the crank pin. The joints between the two halves of the discs are provided with a tongue and groove accurately machined and carefully fitted so that they may be readily assembled on the crank pin, at the same time keeping these parts of the machine perfectly true.

The machine is bolted to the finished inside cheek of the crank which sets the machine perfectly square with the pin. Provision is made for setting to the original center.

This sets the machine perfectly square and central with the original turning of the pin. The company manufacturing this machine has been for many years manufacturing crank pin turning machines for side crank pins and they are thoroughly familiar with the entire proposition of truing up crank pins with portable machines. The machine has a capacity to turn crank pins from 8 inches to 11½ inches in diameter and from 7½ to 9 inches long.

Protection For Ships' Hulls and Power Plants

ON board modern steel vessels one of the most important factors in causing rapid deterioration and high maintenance costs is corrosion. This factor causes many of the troubles of the engineer and is always a source of worry to the master of the vessel.

The Dampney Company of America, Hyde Park, Boston, after many years of research and investigation, placed on the market a well tested protective coating system under the trade name of Apexior. The material used in this system is made in two forms, Apexior Number 1 and Apexior Number 3. Apexior Number 1 is especially adapted for use on surfaces which are subjected to heat and moisture, such for instance, as the inner surfaces of boiler drums, boiler tubes, feed water heaters, hot water tanks, and steam turbines. The material is applied in the same way as paint and will definitely stop old corrosion and pitting and prevent new corrosion and pitting from starting. The coating produced is of a hard smooth surface, very thin, and causes no retardation of heat transfer. The thickness of two coats of Apexior Number 1 is less than twenty-five ten thousandths of an inch. This coating is unaffected by high pressures, high temperatures, or varying conditions in feed water.

The Dampney Company manufactures a power brush especially adapted for the application of Apexior Number 1 to the inner surfaces of the tubes on water-tube boilers and condensers. Two operators, one with this brush and the other with a depositor for placing the right amount of Apexior in each tube, can go over a water-tube boiler and average a little better than one tube per minute.

Apexior Number 3 is designed to protect surfaces subject to cold and moist or hot and dry conditions, as for example, boiler fronts, flues and uptakes, cold water or oil tanks, condenser casings, condenser pumps, ships' bottoms. Apexior Number 3 adheres firmly to steel plates under the action of salt water, and is highly resistant to galvanic action. Its use is, therefore, especially valuable on the stern posts, rudders, and hull plates on the stern portion of steel ships fitted with bronze propellers. In many such cases the use of this coating has done away entirely with the use of zinc plates.

Apexior Number 3 does not claim any antifouling properties. It is primarily an anti corrosion coating, and where the route of the vessel demands protection against marine growths a standard brand of antifouling composition should be applied over the Apexior, which makes an ideal base for such application.

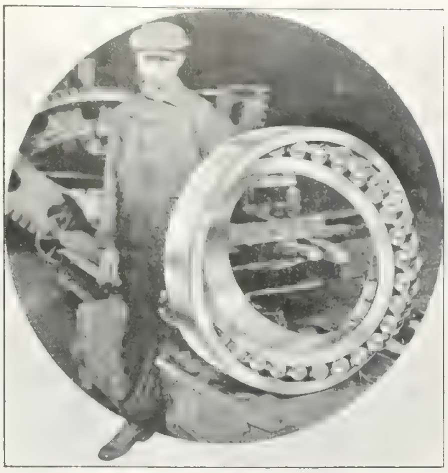
Apexior coatings are distributed on the Pacific Coast by C. C. Moore & Co., Engineers, of San Francisco, who will carry stocks ready for immediate delivery in all their branches, including Portland, Los Angeles, and Seattle. The engineering organization of this well-known firm will be available for expert advice for the solution of corrosion problems and for all special applications of these protective coatings.

Largest Spherical Roller Bearings

TWO huge S. K. F. spherical bearings of the type shown in the accompanying photograph, the largest of their kind in actual service the world over, have been successfully operating for a period of over three years in a "cylpeb" cement mill at the plant of the Dexter Portland Cement Company, Nazareth, Pennsylvania. These bearings, almost three feet in diameter, are carrying the load of a 5½ by 26-foot tube mill used in pulverizing. The mill is driven by a 250-horsepower motor at a speed of 26 revolutions per minute. The load is 50 tons or 25-tons per bearing.

During the three-year period, these bearings have been on the job continuously and the only attention required has been replenishing of lubricant several times a year. In addition to carrying heavy thrust and radial loads, an important feature of these bearings has been their self-aligning characteristics. Any inaccuracies in setting up and settling of foundation is compensated for within the bearings without the need of any external aligning devices or the setting up of internal strains or stresses.

S. K. F. spherical bearings, in principle, differ from the conventional type of roller bearing in that they are self-contained and non-adjustable units. These bearings are made of high carbon chrome steel and uniformly hardened throughout. The rollers are of a barrel shape, and each of the two rows of rollers is permited to operate independently of the other. The rollers and races of S. K. F. spherical bearings are made from charcoal steel, a product of the S. K. F. iron ore mines and steel mills in Sweden. Each roller is drop-forged and individually turned between centers to the highest precision.

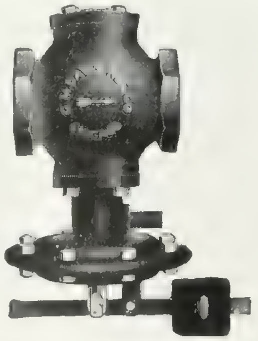


Large S.K.F. spherical roller bearings.

This type of bearing might be profitably used for line shafting on shipboard.

A Pressure Regulator for Low Pressures

AN automatic pressure reducing valve known as the P. & W. type, designed especially for the variable demands of vapor, vacuum, and low pressure heating systems with extreme sensitivity as well as thorough reliability has been developed by the G. M. Davis Regulator Company, builders of automatic valve specialties for more than fifty years. A valve to be successful in this service must be free from friction because the control pressure is low and the fluctuations slight.



Davis low pressure regulator.

Sensitiveness in this Davis regulator is accomplished by the simple method of connecting the disc to the diaphragm. Instead of using a stuffing box—the best of them create some friction—the steam passes through a bronze bushing which has an easy sliding fit. A slight leakage at this point is not objectionable as it is in the low pressure chamber from which the governing pressure is taken. Having a flexible fabric insert rubber diaphragm of large area and a frictionless stem, this valve gives highly accurate and efficient service in all kinds of low pressure steam circulation.

In order to get an accurate average control pressure a small pipe is used to connect the diaphragm chamber with the low pressure line at a point from five to ten feet from the valve. This pipe fills with condensation and protects the diaphragm from the heat of the steam. By placing a globe valve in this line any pumping action that might occur may be controlled. The disc of this regulator is beveled and ground to a close fit in the seats. The counterweight holds the valve open and the reduced pressure closes it. A balance between these two forces is attained in service. When properly installed the diaphragm comes beneath the pipe line. These regulators may be had with either globe or expanded outlet bodies having screwed or flanged ends.

The Davis P. & W. pressure regulator takes its name from the two leading steam heating systems which were in use when it was designed—the Paul and Webster systems. As the function of a regulator is the same in all steam heating, the Davis P. & W. may be used no matter what name is given the system.

Trade Literature

Westinghouse Electric and Manufacturing Company has issued **Circular 1579-E,** a new publication on **Micarta Gears and Pinions.** This publication contains the latest authentic data and technical information relative to the manufacture, design, and form of construction of Micarta gears and pinions. Micarta, a self-supporting, laminated product of specially treated woven fabric, has found a wide application in the non-metallic gear field because of its excellent physical characteristics which adapt the material to use as gears and pinions. Because of the silent, efficient, and economical operation of Micarta gears, many manufacturers are using them in place of untreated steel, cast-iron and bronze gears.

In addition to the general and technical information included in this publication, a new formula and tables, based on the recommended practice of the American Gear Manufacturers Association, are features of this gear booklet. The new gear formula, adopted at the May, 1927, meeting of A. G. M. A., gives Micarta gears much higher horsepower ratings at higher speeds than heretofore.

Trade Literature

De La Vergne Diesel Engines. This is a booklet recently brought out by the **De La Vergne Machine Company** and is a technical description of the vertical solid injection diesel engines manufactured by this company. It contains forty pages, is bound in buff cardboard, and is profusely illustrated. The compilers have endeavored to portray in a brief and concise manner the excellence of design, ruggedness of construction, simplicity of operation, and general reliability of these engines.

The De La Vergne Machine Company has been building prime movers for more than forty years and since 1893 has installed more than 400,000 horsepower of heavy duty oil engines in all parts of the world. A perusal of this booklet should be of interest and profit to anyone interested in the internal combustion engine for marine or stationary power purposes.

Incidents Instead of Disasters. With the awakening of the executives of all lines of industry to the necessity of safety and precautionary measures in the conservation of life and property, there has grown up a demand for booklets describing safe practices. The pamphlet "Incidents Instead of Disasters," is especially directed along this line to the marine fraternity. All shipowners who are interested in properly and completely protecting their ships against the great hazard of fire should read this little booklet. It is published and distributed by **Walter Kidde & Company, Inc.,** manufacturers and distributors of the Lux-Rich system of fire protection and detection.

Nelseco Diesel Engines is the name of a booklet recently issued by **The New London Ship and Engine Company** of Groton, Connecticut. This is in the nature of a catalog describing briefly the history of the Nelseco-M. A. N. engine, economies to be derived from diesel operation, general constructional features of the Nelseco type MI engine, and tables giving dimensions of direct, electric, and gear reduction drives.

The Nelseco Type MI engine is of the 4-cycle mechanical injection type and has found wide popularity in a great variety of marine installations. The excellent design of the engine assures low fuel consumption, low maintenance cost, and a long life of reliable operation.

Copies of the booklet may be obtained by addressing the company at Groton, Connecticut, or this magazine.

The "Stone" System for Hydraulically Controlling Bulkhead Doors is the title of a very interesting booklet that has come to our desk from **J. Stone & Company, Limited,** Engineers of London.

The control and installation of hydraulically operated bulkhead doors is a phase of safe and successful steamship operation that has not been given a great deal of publicity, although lately we had a very striking example, in the collision of the Malolo and the saving of the vessel by the quick closing of the bulkhead doors, of the dependence that shipowners can put on this equipment.

This booklet describes the Stone door control system, its installation on shipboard, and cites a number of graphic instances of its successful operation. An extract from the British Board of Trade's regulations relating to bulkhead and water-tight compartments on passenger ships is also given.

For copies of this booklet kindly address this magazine.

Edison Electric Bakery, Hotel, and Restaurant Equipment. Catalog No. G-7 has been issued by the **Edison Electric Appliance Company** of Chicago, covering their electric cooking appliances for use in every type of galley, kitchen, bakery, or pantry.

The catalog gives in all details the complete line of equipment carried, the application of all appliances, attachments, and separate units, and full descriptions and dimensions of all these items. Clear-cut photographs of all types of equipment are given, so that a great deal of new and interesting information on the quick and sanitary preparation of food may be gained by perusing one of these catalog-booklets. Copies can be obtained free of charge by addressing the home office, any of the branch offices, or this magazine.

Busch-Sulzer Marine Diesel Engines. This is certainly The Motorship Era, which point is brought out in the recently issued catalog by the **Busch-Sulzer Bros. Diesel Engine Company** of St. Louis.

The best proof of the efficiency and economy of this type of prime mover is gained from its steadily increasing popularity in all classes of American ships. The catalog, besides the usual description of the various sizes and capacities of engines for a wide variety of installations, gives a list of the motorships equipped with the 2-cycle, single-acting engines of Sulzer and Busch-Sulzer types. The booklet contains sixteen pages and may be obtained from the office of the company at St. Louis or through this magazine.

The **Worthington Pump and Machinery Corporation,** 115 Broadway, New York, has issued Bulletin No. W613 on **Worthington High-Efficiency Centrifugal Pumps.** These pumps have efficiencies of from 8 to 10 points higher than the average centrifugal pump. The bulletin describes the new pumps in detail. It also tells how 10,000 pump inquiries were analyzed to determine the heads and capacities most commonly specified by pump users. With this analysis as a basis Worthington engineers set about designing new lines of high efficiencies especially for those heads and capacities most commonly specified by users.

The American Marine Standards Committee of the Department of Commerce, Washington, D. C., has recently issued the following list of publications which should be of interest to shipowners, naval architects, and ship builders. Copies may be purchased from the Government Printing Office, Washington, D. C.

Glass for Air Ports and Fixed Lights. Price 5 cents.

Mooring Bitts, Cast-Steel (standard). Price 5 cents.

Kinds and Sizes of Hose for Ship Equipment. Price 5 cents.

General Instructions for Operation, Care, and Upkeep of Scotch Type Marine Boilers. Price 10 cents.

Equipment and Methods for Safety on Ships. Price 5 cents.

Marine Insurance

Edited by JAMES A. QUINBY

Substituted Expense in General Average

PACIFIC COAST underwriters have become all too familiar with the pernicious custom of extending general average liability by agreement. It is, therefore somewhat refreshing to read of a finding by the Commissioner of the United States District Court in New York, in the case of Willcox Peck & Hughes versus Alphonse Weil & Brothers and the Insurance Company of North America, which may be a trifle discouraging to ambitious young adjusters.

The finding in question resulted from a libel in a cause of general average filed by Willcox Peck & Hughes as trustees under an average bond against the owners and insurers of four thousand salted hides in the British steamer Domingo de Larrinaga from Buenos Aires via Boston to New York.

The vessel stranded outside Boston and was towed into the harbor in distress. Upon discharge of the Boston cargo, the hides and other New York cargo in No. 1 hold, the vessel was found to have sustained serious damage. If permanent repairs were made at

Ballad of the Stanley Robert.

(Note—Shortly after midnight on July 25, 1927, the river boat Stanley Robert capsized after striking a sunken cargo of pipe on the lower reaches of the San Joaquin River. Three men were lost, while two were saved by the master of the vessel.)

There was comfort in the friendly lights that lined the Pittsburg shore,
As she rolled along with the muddy ebb that ran three knots or more.
Her engines purring steadily—the river wide and free—
With naught to fear—the night was clear—what danger could there be?
But far beneath the swirling tide, in a spot which no man knew,
There lurked with arms outstretched a death for the Stanley Robert's crew.

There was no hint of tragedy—no gleam of warning light,
As Captain Stanley Jackson held his course that fatal night.
A jarring crash—"My God, we've struck!" — the shock of wood on steel—
The pilot staggered back, aghast, from the Robert's jerking wheel.
No time to hail the distant shore or launch a life boat then,
Nor time to pray nor time to stay to wake the sleeping men.

The stricken vessel rolled to port and kept her rendezvous
With the grinning death whose fingers sought her luckless sleeping crew.
And men screamed once and fought their fight—Aye, fought their fight and died;
Or kicked their choking way amid the black and icy tide.
And our gallant skipper hurtled down—then the skipper up came he—
Score one for Cap'n Jackson—For the death below, score three.

Now, past him in the murky dark, a gasping figure slipped,
A man—his man—with numbing limbs which the hands of Death had gripped.
That way lay death—this way calls life on the stranded Robert's keel,
But the love of another's life is the love that a Captain's heart must feel.
He plunged downstream and got his man from the clutch of the grisly foe.
Score two for Skipper Jackson—score three for the death below.

A hail floats through the darkness, a boat puts out from shore,
But our overworked commander must face his test once more.
Another cry from downstream, pleading, faint and thin—
The skipper's arms churned foam again as he brought the beggar in.
And so the score was evened, the score of a man with the sea.
Check three for Cap'n Jackson—for the death below mark three.

Now the Robert is no greyhound, to course the seven seas,
And her skipper wears no shining braid upon his dungarees.
I doubt if he'll approve my screed of limping verse about him,
But, Mates, how could our blooming ballad get along without him?
So pipe all hands, and sing aloft. As Kipling's stanzas ran,
Here's to you, Stanley Jackson, you're a first-class river man.

J. A. Q.

Arthur M. Brown **EDWARD BROWN & SONS** *Arthur M. Brown, Jr.*
MARINE DEPARTMENT—*Harry W. Browne, Manager*
PACIFIC COAST GENERAL AGENTS
THE GLOBE & RUTGERS FIRE INSURANCE CO., INC.
200 BUSH STREET, SAN FRANCISCO

FIREMAN'S FUND
Insures Hulls, Cargoes,
HEAD OFFICE: CALIFORNIA and SANSOME

JOSEPH HADLEY,
European Agent
3 LOTHBURY, E. C.
LONDON

E. A. VALENTINE, Resident Agent for Oregon
714-715 BOARD OF TRADE BUILDING
PORTLAND, ORE.

FRANK G. TAYLOR, MANAGER, PACIFIC NORTHWEST BRANCH

Boston, all the cargo would have to be discharged and stored. The alternative would be to proceed to New York in tow after effecting temporary repairs.

Owners Entitled to Cargo

The owners of all the New York cargo, save Weil & Brothers, chose to proceed to New York in tow. Weil & Brothers, however, having found that their hides were 33 1/3 per cent damaged by sea water, and fearing that the slow trip in tow to New York would result in their total loss, demanded and received delivery of the hides at Boston.

The North America, as insurers of the hides, signed the adjusters' usual general average guarantee. When the consignees demanded their cargo at Boston, the adjusters presented a further agreement subjecting the hides to the same general average as if carried in the steamer to New York and delivered there. This agreement the consignees and their underwriters refused to sign. In spite of such refusal, however, the consignees obtained their goods at Boston upon payment of the full freight.

The adjusters then filed their libel as above noted, the issue being whether the hides were chargeable in general average with their portion of the expense incurred by the transportation of the vessel in tow from Boston to New York.

Cargo Position Upheld

The commissioner ruled against the adjusters and in favor of the cargo owners, recommending that the libel be dismissed on the ground that a common interest in the removal to New York did not exist, and that the owners of the hides could not equitably be called upon to subject their goods to the danger of total loss for the benefit of the remaining interests. The commissioner's report, in part, reads as follows:

"In general average the enterprise is necessarily considered as a whole. In apportioning the loss regard is had, of course, to the interest of the respective parties; but in other respects no separate interest is recognized. Until, therefore, some portion of the property has been separated from the rest to the exclusion of any common interest with it, every risk which affects the enterprise as a whole must be regarded as affecting each portion of the property engaged. Such separation frequently occurs in the course of a voyage, as, for instance, in case of jettison. Or a separation may occur through the withdrawal of a portion of the cargo before the termination of the voyage. This every owner has a right to do at any time, on payment of freight for the entire voyage, and the cargo thus withdrawn is exempt from contribution for any subsequent loss or expense. In other words, while the property remains connected the owners have a common interest in the enterprise, but the tie which connects them, being purely accidental, not conventional or contractual, may be broken at will at any time by any of the parties. (Nelson versus Belmont, 21 N. Y. 36; McAndrews versus Thatcher, 3 Wall. 347). It is only in cases where cargo is saved and delivered in the course of a continuous operation that the common interest continues after delivery of cargo to the owner; inasmuch as all interests may not be brought to safety at one time, the community of interest in respect of the entire operation is deemed to continue from the inception of the operation. (Pacific Mail Steamship Co. versus Mining Co., 74 Fed. 564; Reliance Marine Insurance Co. versus New York and Cuba Mail Steamship Company, 77 Fed. 317; Nelson versus Belmont, 21 N. Y. 36; Moran versus Jones, 71 El. & Bl. 523).

Additional Sacrifice Cannot Be Imposed on Individual Interest

"Sacrifice on the part of any interest is justifiable only when it is for the benefit of all; neither ship nor cargo can be required to make a vicarious sacrifice. When, therefore, a cargo owner finds a vessel with his cargo on board in a port or refuge needing repairs which can be effected only at a cost to him of more than he would lose by taking his property at that place and paying the vessel her lawful charges against him, he may undoubtedly pay the charges and reclaim his property. The law does not require him to submit to a sacrifice of his own interests for the benefit of others. (The Julia Blake, 107 U. S. 418).

"Whether in case of misfortune, a common interest still remains is a question of fact depending on the circumstances. (The L'Amerique, 35 Fed. 835). The sole justification of the towage venture here in question was the alleged saving of expense involved in unloading, storing and reloading cargo if the vessel were repaired at Boston. The hides in question had been unloaded in connection with the survey of damage to the vessel, and the acceptance of delivery by the consignee eliminated from the common charge the cost of their storage or reloading and discharge at New York. But the significant fact is that these hides were admittedly landed at Boston one-third damaged by salt water, and would inevitably have sustained further damage during slow transportation to New York. The towage venture therefore involved further sacrifice by the consignee of the hides for the benefit of the other New York cargo, to which the consignee could not be required to submit."

INSURANCE COMPANY
Freights and Disbursements
STREETS, SAN FRANCISCO, CALIFORNIA

W. H. WOODRUFF, Manager, Southern California Marine Branch
740 SOUTH BROADWAY
LOS ANGELES

CHARLES R. PAGE, Manager
ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

309 COLMAN BUILDING, SEATTLE, WASHINGTON

Progressive Unseaworthiness

Two interesting questions—one having to do with unseaworthiness and the other with the possibility of waiving the benefit of the Fire Statute—appear in the case of Porter et al versus The Bank Line, recently decided by the District Court for the Eastern District of Virginia.

Suit was brought by some forty-six libelants for damage to cargo resulting from fire on board the British steamship Poleric while the vessel was making temporary repairs at the Azores during the course of a voyage from Calcutta to New York and Boston.

The owners claimed the benefit of the fire statute of the United States (Sec. 4282 R. S.), which is unequivocal and reads as follows:

"No owner of any vessel shall be liable to answer for or make good to any person any loss or damage, which may happen to any merchandise whatsoever, which shall be shipped, taken in, or put on board any such vessel, by reason or by means of any fire happening to or on board the vessel unless such fire is caused by the design or neglect of such owner."

Waiver of Statute Claimed

Libelants claimed that the unlimited benefit of the statute had been waived by the bill of lading in the instant case, which provided, among other things, that the vessel was not to be liable for the consequences of fire, provided she was seaworthy upon sailing.

After pointing out that the statute may be waived by provisions in the bill of lading, the court proceeds to hold that the above clause may and probably does constitute a waiver. This holding is expressly labeled as dicta, however, on the ground that the court's later ruling on the point of unseaworthiness makes it unnecessary.

It appears that the Poleric, a vessel some twenty years of age, was overhauled on the Clyde in 1920. She then sailed for New York, and from the time of such sailing until her final disaster in mid-Atlantic on a subsequent voyage, experienced an unusual succession of boiler and machinery troubles. These difficulties were apparently due either to extreme negligence of the engineroom crew or to some basic defect in the machinery, intensified by bad weather. The boilers were frequently refilled with salt water en route to New York, and the repairs effected at that port resulted in little, if any, improvement. She arrived at Calcutta, via Colon and Yokohama, with the deplorable condition of her boilers unchanged. Repairs at Calcutta failed to remedy the situation.

Knowledge Charged to Owners

The Court observes that to attribute this series of misfortunes to the engine room crew would be to charge criminal negligence against four different chief engineers, all of whom were shown to have been competent. It is therefore concluded that the difficulty with the vessel was basic in nature, and that the reports of successive and continuous engine trouble should have put the owners on notice of this fact. The owners are therefore found to have been privy to the obvious unseaworthiness of the ship when she sailed from New York and subsequent ports of call.

Under this view the cargo owners were allowed to recover their damages in full, since the owners were not entitled to the benefit of the fire statute or the bill of lading provision.

The assumption that every shipowner who knows of extensive repairs to his vessel is privy to her unseaworthy condition is startling, to say the least. If this principle is universally applied, we fear that it will result in a tremendous increase of legally unseaworthy tonnage. Most shipowners we have met rely on the frequency of repairs to support their diligence in furnishing a seaworthy vessel.

Mixed Cargo

Ordinarily, summer is a time of comparative rest and quiet along the Rialto, but this summer has been an exception. Just cast your eye over some of the things that have put sleepless nights in the Pacific Coast underwriters' dog days, if you know what I mean.

There was the Jacob Luckenbach, ashore on the coast of Costa Rica in May, and towed into New Orleans in July, a constructive total loss. News of the Admiral Watson ashore on Prince Rupert Island brings memories of the ill-fated Indiana Harbor. The Suremico and the Arkansas lock horns off Tatoosh, causing a three hundred thousand dollar loss for somebody. Then there is the tangle between the Jacox and the Celilo, and the Northland-Pacific Trader affair. Even our calm and sedate inland waters have contributed the Stanley Robert case, which has moved us to the lyric outburst of poesy at the head of the column.

Old Man Jinx forgot to take his summer vacation.

This same Stanley Robert matter, mentioned a couple of times above, has enough angles to afford a complete object lesson for our class in marine insurance and admiralty law.

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The good ship Sonoma, coming down the river, struck a barge loaded with heavy steel pipe, under circumstances promising the usual measure of difficulty in ascertaining liability. The barge capsized, dropping the pipe in mid-channel. The barge owners marked the obstruction, but it failed to stay marked, and the Stanley Robert crashed into the pipe the next night, suffering heavy damage to her hull, and causing the loss of three lives and her entire cargo. Just think of the possibilities for argument during the long winter evenings.

As Al Young says, it's a sort of house that Jack built. You know—"This is the boat that sank the barge that dropped the pipe that sank the Stanley Robert."

The Newport, which sank the ferry Golden City in San Francisco Bay, has furnished us with a couple of good collision stories. You will remember that the passengers on the ferry were able to walk off the boat deck directly onto the deck of the Newport.

We have recently heard that the cashier of the restaurant on the Golden City, in backing up a claim against his insurers, explained that he could not save the money in the till, as the bow of the Newport prevented the opening of the cash register.

The covey of underwriters that went out to inspect the waterlogged Northland off Hunter's Point last month represented the cream of the street, but they didn't look natural. A. B. Knowles climbed over the side without the usual two-bit perfecto in the starboard quarter of his face. Charley Jones' coun-

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BROKERS FOR THE ASSURED—AVERAGE ADJUSTERS

tenance seemed almost indecently naked without a cigarette, and even Dave Young had his ancient briar stowed well aft and battened down.

And for why? Simply because the cargo of the (erstwhile) good ship consisted largely of dynamite, caps, blasting powder, and alcohol.

Selection and Care of Wire Rope

WIRE rope as applied to shop cranes and electric hoists is frequently subjected to severe usage and not uncommonly to excessive overloads. Because of their very intimate relation with workmen and the necessity for swinging their loads over all floor equipment, the safety factor is a consideration of first importance in not only their selection but subsequent care.

According to the American Cable Company, ordinary shop cranes and hoists employ one of three types of wire rope, viz: 6x19, 6x37 or 8x19. Grade is usually plow or improved plow steel, while drums and sheaves should have diameters not less than 30, 20 and 20 times the rope diameters in the order of rope types named. When in service on skull crackers, strippers, bridge cranes or other equipment that continuously handles capacity loads, the wire rope should be of the 6x37 construction and the factor of safety no lower than 7. That is to say, the rated capacity of the hoist or crane should not cause a stress in the rope of more than one-seventh of the actual tensile strength of the rope.

Ropes on ladle or hot metal cranes are more or less constantly subjected to high heat and all such ropes should be supplied, in construction, with a 7x7 Independent wire rope center. Subjection to considerable heat will char the hemp center of ordinary rope with greatly reduced rope life and safety to workers as the result. The factor of safety on these ropes is usually 8 as a minimum, the minimum drum and sheave diameters 30 times the rope diameter, and the rope service limited to periods ranging from 9 to 15 months. In ladle crane application the wire ropes, except for Tru-Lay rope, need to be stretched out on the floor before reeving on the crane in order that the rope may tend to "bird-cage" close to the equalizing sheave, and when this occurs, rope life is materially shortened and workers endangered.

Theoretically, equalizing or compensating sheaves may not be considered as an operating sheave. Actually, however, there is a movement of the rope over such sheaves and it must be admitted that nearly any movement will naturally set up wear or have abrasive tendencies. Rigid inspection should be made of the underside of the rope bearing on equalizing sheaves since it is the hidden section that is the most critical.

All sheave and drum grooves should be inspected frequently for wear, as a worn sheave tread can do great damage to a rope. At the time rope replacement is made, strict adherence to rope size and sheave fit must be made the rule if proper rope service is expected or desired. A pinching sheave can do more damage to a wire rope in one hour than will a properly sized sheave in an entire week.

Another factor that is frequently responsible for early rope failure is lack of proper lubrication. Practically all the cores of good brands of wire rope are thoroughly impregnated with a commercial, chemically-neutral rope oil. While the core retains a liberal supply of this lubricant which gradualy oozes out as the rope is used, still, frequent application of a good lubricant during service is necessary to prevent the core becoming dry and absorbing moisture which will set up corrosion of the inner wires, or the outer wires from losing their film of oil. A rather thick, semi-plastic compound applied while hot and in a thinned condition is perhaps the best possible lubricant for hoist and shop crane ropes. In its heated state it will penetrate after which, when cool, will constitute a plastic filler that will act in the dual capacity as a preservant and lubricant.

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Acknowledgment is made to Walter Voigtlander, rope engineer of the American Cable Company, New York, for this data.

Trade Literature

Wright Whirlwind Engine. By T. H. Wickenden, Development and Research Department, The International Nickel Company, Inc., 67 Wall street, New York, N. Y. (eight pages). A brief history of the development of the Wright air-cooled motors with detailed information on the construction of the Wright Model J-5C Whirlwind engine.

Balfour, Guthrie---Jensen and Kessler Consolidate

New General Agency to be One of the Largest in West

BALFOUR, Kessler Agencies, Incorporated, is the name of a new organization that on September 1 will start to function as general agents in the Pacific Coast states, Mountain states, Hawaii, and Alaska. It is the result of an amalgamation of the marine and fire insurance business of Balfour, Guthrie & Company, and the casualty, bonding and fire insurance business of Jensen & Kessler. Head offices of the agency will be located in the Balfour Building at Sansome and California streets, San Francisco.

This consolidation is the largest that has been taken place in western insurance circles in recent years and will result in the forming of one of the most important general agencies west of Chicago. It will represent an imposing array of fire, casualty, and marine companies, a complete list of which is given at the end of this article. The organization will provide brokers and agents with a complete insurance service, embracing every form of coverage with the exception of life insurance.

World Wide Activities

Balfour, Guthrie & Company is a very old firm, established in San Francisco in 1869, and with activities in every quarter of the globe. It has been actively identified with the development of California for over half a century.

The firm of Jensen & Kessler succeeded Charles J. Okell & Company on the retirement of Mr. Okell from business activity. Charles J. Okell & Company have been in the insurance business for a period of forty years, having represented the Employers' Liability Assurance Corporation during that period. Messrs. Jensen & Kessler have been associated with Mr. Okell for a great many years and upon his retirement succeeded to the general agency.

Charles V. Jensen.

Don Kessler.

Companies Represented

Balfour, Kessler Agencies, Incorporated, will represent the following companies:

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Employers' Fire Insurance Co.
Caledonian Insurance Co.
Camden Fire Insurance Assn.
London and Provincial Marine and General Insurance Co.
North China Insurance Co., Ltd.
Queensland Insurance Co., Ltd.
Rochester Dept. Great American Insurance Co., N. Y.
Union Insurance Society of Canton, Ltd.

Casualty

Employers' Liability Assurance Corporation, Ltd.
American Employers' Insurance Co.

Marine

American and Foreign Insurance Co.
British and Foreign Marine Insurance Co., Ltd.
The Yang-Tsze Insurance Assn., Ltd.
North China Insurance Co., Ltd.
Queensland Insurance Co., Ltd.
Union Insurance Society of Canton, Ltd.
The Pennsylvania Fire Insurance Co. (Marine Dept.)

Associated Boat Industries

For the purpose of promoting the interest of the general public and particularly the residents of the cities bordering on San Francisco Bay in the possibilities for pleasure, recreation, and health, to be gained by cruising on the expansive waters of San Francisco Bay and its tributaries, an organization has been formed by boat builders and various supply houses to be known as the Associated oBat Industries. George S. Lacey, manufacturers' agent, has been elected president; Lester Stone of W. F. Stone & Co., Oakland boatbuilder, is vice-president, and Louis Ets-Hokin, of the San Francisco firm of Ets-Hokin & Galvan, is secretary-treasurer.

The new organization plans an active advertising campaign and credit and financial bureau to help the expansion of motorboat and yacht owning.

George O. Hoadley.

American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Shipbuilding Work in Prospect

TWO NEW FERRIES FOR SAN FRANCISCO

The Golden Gate Ferry Company of San Francisco, A. O. Stewart, president, which in June put into service on San Francisco Bay three new diesel-electric ferryboats, will build two additional ferries of similar type in the near future. This announcement was made in a statement to the stockholders by the president of the company..

This company transported 614 419 vehicles across San Francisco Bay during the first seven months of 1927, and indications are that the new service between San Francisco and Berkeley will bring a constantly increasing demand for service.

FERRYBOAT FOR SEATTLE

The Kitsap County Transportation Company of Seattle, Capt. John L. Anderson, president, has plans for a 200-foot ferryboat to be powered with Washington-Estep diesel engines. The ferryboat will have a capacity of 1,000 passengers and 90 automobiles and will be operated between Seattle and Bainbridge Island.

NEW BIDS TO BE OPENED BY CANADIAN NATIONAL RAILWAYS ON PASSENGER AND FREIGHT STEAMERS.

The bids opened last July for five passenger and freight vessels for the Canadian National Railways at Montreal for their West Indies service were thrown out and new bids will be opened September 12. The original specifications called for motor drive, three of the vessels to be combination passenger and freight vessels and two refrigeration. The tenders submitted on the original specifications were too high for the appropriations; so the new tenders will be submitted for turbine drive, with sufficient changes in other particulars to bring the cost within the funds available.

The shipbuilding firms in Canada asked to submit bids for this work were: Halifax Shipyards, Ltd.; Canadian Vickers, Ltd., Montreal; Davie Shipbuilding Company, Lauzon, Quebec; Burrard Dry Dock Co., Vancouver; and Yarrows, Ltd., Victoria.

These boats will have a cargo capacity of about 3000 tons, with special provision for 70,000 stems of bananas and for the carriage of fresh fruits in cold storage. Accommodations will be provided for 100 first class, 30 second class, 50 third class, and 50 deck passengers.

NEW DIESEL-ELECTRIC TUGBOATS PLANNED FOR NEW YORK HARBOR.

According to reports from the East, the Long Island Railroad Company of New York is planning the construction of a tugboat to have diesel-electric power plant. This company now has one diesel-electric tug in operation, this being 100 feet long and equipped with Ingersoll-Rand vertical, single-acting diesel engines of 400-brake horsepower, the electrical equipment being of Westinghouse Electric and Manufacturing Company manufacture.

FOUR EXCURSION STEAMERS PLANNED FOR EAST COAST

Henry J. Gielow, Inc., 25 West 43rd Street, New York, who designed the large yacht now building by the Pusey and Jones Corporation for John Cadwalader, is reported to be working on plans for four 400-foot excursion steamers for The Keansburg Steamship Company, Keansburg, New Jersey, W. A. Gelhaus, president. These boats, it is said, are to be used in a new service to Coney Island.

THEODORE FERRIS PLANNING TWO COLLIERS

Theodore E. Ferris, 1 Church Street, New York, is drawing up plans and specifications for two colliers for the Berwind-White Coal Mine Company of New York.

FIRE DESTROYS STOCKTON TOWING FLEET.

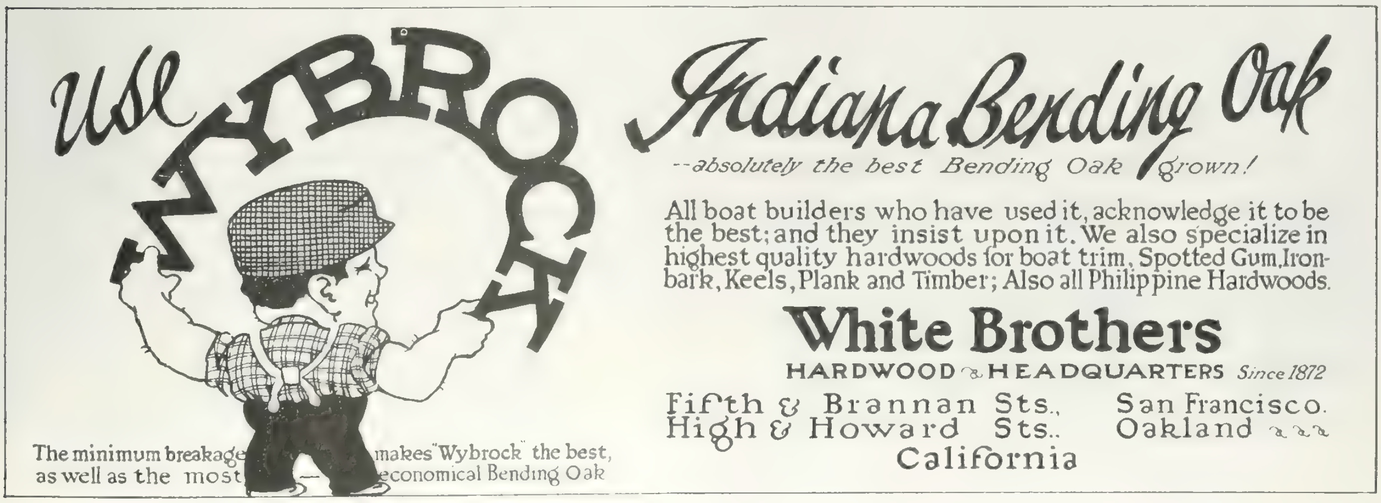
Twelve river boats, comprising the fleet of the Island Transportation Company of Stockton, California, were destroyed by fire on August 21. An explosion on one of the tugs, the Island Countess, spread flames to the whole fleet, which was tied up in Smith Canal, two miles west of the city.

Captain Benjamin Walters, head of the company, said his loss would reach $150,000. The destroyed fleet was made up of seven gasoline towboats, three speedboats, and two barges.

SHIPPING BOARD SELLS STEAMER POTOMAC.

The Shipping Board has accepted the offer of Phillip Edward Ittmann of 1 Madison Avenue, New York, to purchase the steamship Potomac for $50,000 cash "as is, where is."

The Potomac is the former German passenger vessel Neckar, of 9709 gross tons, equipped with two quadruple expansion engines, 5600 indicated horsepower, and five Scotch boilers, designed to steam approximately 13½ knots on 103 tons of coal a day. She is reported to accommodate about 350 first and an equal number of second class passengers, in addition to a large number of third-class and steerage. She is at present in lay-up at New York. The Neckar was built at Geestemunde in 1900.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NEW COMPANY TO BUILD BOATS

The Standard Shipbuilding Company is being formed by the Standard Boiler and Steel Works, Los Angeles, to build stock fishing boats. George J. Kuhrts, Jr., is general manager.

JOB FOR MARE ISLAND

The Navy Department has authorized the lengthening of the flying deck on the airplane carrier Langley, work to be done at Mare Island.

BIDS CALLED FOR DIESEL ENGINES

Bids will be opened August 15 at the New York Office of Captain R. D. Gatewood of the Merchant Fleet Corporation for additional diesel engines for installation in Shipping Board freighters. Bids have been asked on groups of two, three, four, and six engines of 4,000 shaft horsepower at 105 to 115 revolutions a minute. From eight to twelve engines will be ordered.

Plans are also being made for conversion of two or three vessels to diesel-electric drive. These plans and specifications are being worked out by Gibbs Brothers of New York and Admiral D. W. Taylor, U. S. N., retired.

CONVERSION BIDS OPENED

Bids were opened at the office of J. C. Rohlfs, marine department, Standard Oil Company of California, for work of installing diesel-electric machinery in the tank steamer District of Columbia. The diesel engines are being manufactured by Busch-Sulzer Bros. Diesel Engine Company and the electrical machinery by the Westinghouse Electric and Manufacturing Company. This will be one of the largest diesel-electric propelled vessels in the world. The District of Columbia is now laid up at San Francisco. Mr. Rohlfs reports that the bids were higher than anticipated and awards will not be made for about two weeks.

NEW VESSELS FOR MEXICAN SERVICE

According to George Wythe, acting commercial attache at Mexico City, the Mexican Consul General in New York has instructions to contract for the construction of two new 5000-ton passenger and freight steamers for the Mexican Government to be operated by the National Navigation Lines, one on the Atlantic and Gulf, and the other on the Pacific Coast.

FERRYBOATS FOR HONGKONG

New ferry service between Hong Kong and Kowloon for vehicular traffic will be provided by the government, according to Harold Shantz, consul at Hong Kong. The scheme provides for construction of piers and ferries to carry 20 touring cars in addition to accommodations for 540 first class and 250 third class passengers.

ISTHMIAN IS IN MARKET FOR NEW FREIGHTERS

In spite of frequent denials by officials of the Isthmian Steamship Company of New York, it is persistently rumored that keels for two or three freighters will be laid down at the yards of the Federal Shipbuilding Company, Kearny, New Jersey, in the new future. It is reported that high pressure steam turbine drive will be used and that these vessels will be of size and power to put them in the cargo liner class.

SCHOONER PLANNED FOR CANADIAN SERVICE

It is reported to us that the Royal Canadian Mounted Police is planning the construction of a 95-foot schooner for patrol work in the Arctic Ocean from Herschel Island.

LUCKENBACH FLEET MAY BE INCREASED

With the declaration the early part of this month that the steamship Jacob Luckenbach is a constructive total loss, great weight is given to the rumor that the Luckenbach Steamship Company, with headquarters in New York, is planning the addition of four fast freight vessels to its intercoastal fleet.

Recent Shipbuilding Contracts

INTER-ISLAND STEAMER AWARD

Arthur H. Armitage arrived in San Francisco on August 9 from Honolulu to sign a contract with the Bethlehem Shipbuilding Corporation for the construction of a passenger and freight steamer for the Inter-Island Steam Navigation Company.

The vessel is to have geared turbine drive, employing Westinghouse geared turbines, which will develop 4000 shaft horsepower. Four Babcock & Wilcox oil-burning marine boilers will supply the steam. The Westinghouse Electric and Manufacturing Company have the contract for the complete electrical equipment of this vessel, including equipment for staterooms and public rooms, electrical galley equipment, electrically operated compressors, pumps, etc.

The construction of the vessel will be supervised by the Matson Navigation Company. She will be 310 feet over-all, 48 feet beam, and 27 feet 6 inches molded depth, and will have a speed of 15 knots. The vessel will cost about $1,500,000.

AMERICAN SHIPBUILDING COMPANY AWARDED CONTRACT

American Shipbuilding Company, Cleveland, Ohio, has an order from the Standard Oil Company of Indiana for a tank steamer. The vessel will be 373 feet between perpendiculars, 52 feet beam, and 20 feet loaded draft, with a speed of 14 miles an hour. She will be of 6200 deadweight tons. Triple expansion engines of 1800 indicated horsepower and two Scotch marine boilers will make up the propelling equipment.

This yard also has an order for a tank steamer for eastern interests whose identity was not made known.

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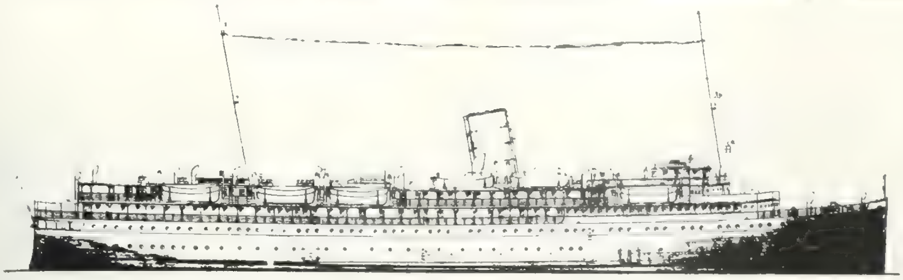

The outboard profile herewith is that of the steamship Evangeline and her sister ship the Yarmouth, the last two keels to be laid in the historical shipyard of Wm. Cramp & Sons Ship & Engine Building Company. The Yarmouth was delivered to the owners, the Eastern Steamship Lines, on July 7, and the Evangeline will be delivered September 1.

These two boats were designed by Theodore E. Ferris of New York. They are 378 feet long, 55 feet 6 inches beam, and are driven by two Parsons steam turbines developing 7500 shaft horsepower. They are built for passenger and freight service in the Atlantic coastwise trade.

The tanker will be 334 feet between perpendiculars, 51 feet beam, 18 feet loaded draft, 11½ miles speed, 3700 tons deadweight, and will be powered by diesel engines of 1900 horsepower. A Scotch marine boiler will be installed for auxiliary power.

Newport News Shipbuilding and Drydock Co. has an order from the Chesapeake Steamship Company for a bay steamer to be 277 feet long, 53 feet beam and 18 feet draft. Keel will be laid in October..

This company has an order for a sister ship, with the slight difference of a 12-foot shorter length, keel for which will be laid in November.

Nashville Bridge Company, Nashville, Tenn., is building a deck barge for stock.

The Pusey & Jones Corp., Wilmington, Delaware, has an order from the Baltimore Steam Packet Company of Baltimore, Maryland, for a night passenger and freight steamer to be 320 feet between perpendiculars, 56 feet 6 inches beam, and 15 feet 6 inches loaded draft aft. She will have a speed of 18½ miles an hour and will be of 1754 gross tons. A 4-cylinder triple expansion engine will develop 2600 horsepower, steam to be supplied by four Scotch boilers.

Charles Ward Engineering Works, Charleston, West Virginia, has an order from the United States Department of Engineers at St. Louis for a steel hull diesel-electric stern-wheel towboat, to be 110 by 23 by 5 feet.

This yard also has an order from the U. S. Army Engineers, New Orleans office, for a diesel powered, steel hull inspection boat to be 85 by 18 by 7 feet.

BETHLEHEM TO INSTALL ENGINES IN WILSCOX

On a bid of $416,000, the Bethlehem Shipbuilding Corporation has received a contract from the Shipping Board for the installation of diesel engines in the freight Wilscox. The propulsion unit will consist of a 2-cycle, double-acting Nelseco-M. A. N. type diesel engine developing 3680 shaft horsepower from four cylinders at 115 revolutions a minute.

This engine, built by the New London Ship and Engine Co., was fully described in the last issue of this magazine.

TODD PLANT RECONDITIONING STEAMSHIP HAVANA

Work is progressing rapidly at the plant of the Todd Dry Docks, Inc., Seattle, on the reconditioning of the former U. S. Hospital ship Comfort (ex-Havana), which was recently purchased by the Atlantic, Gulf and West Indies Steamship Lines and will be put into service on their Ward Line. Theodore E. Ferris of New York has designed the layout of the new passenger quarters and will supervise the reconstruction work.

The interior construction used by the navy has been ripped out and work will now be started on the building of accommodations for 200 first class passengers. in regular and special suites, and about 75 second class passenger in regular inside and outside staterooms. New public rooms will also be built into the hull, including a dining room seating 122 persons. A new lounge and music room, writing room and library, smoking room, and veranda and tea room aft. The second class quarters will have a social hall, smoking room, and dining room.

All of the passenger accommodations will be attractively decorated and comfortably equipped for the service which this vessel will enter.

The machinery will be entirely overhauled and new water-tube boilers installed. Every effort will be made to equip this vessel for efficient and safe transportation of passengers. The contract cost of the work is about $800,000. The steamship Havana will be ready for service next December.

ATLANTIC REFINING COMPANY RECONDITIONING TANKERS

Three modern tankers will be added to the fleet of the Atlantic Refining Company with the conversion to diesel-electric drive of three tank steamers purchased from the Shipping Board. The first of these, the Point Breeze, formerly the J. M. Connally, has already been put into operation, the work having been done at the Point Breeze Plant of the Atlantic Refining Company. The other two are the Sharon and Bessemer. These are each of 7000 tons deadweight, and are being converted by the Alabama Drydock and Shipbuilding Company at Mobile.

The new power plants will consist of Ingersoll-Rand diesel engines and electric equipment furnished by the General Electric Company. Each tanker is equipped with three 850-horsepower, 225 revolutions per minute, diesel engines, each driving a 525-kilowatt, 250-volt generator for propulsion and a 50-kilowatt, 250-volt auxiliary generator for excitation and auxiliary power. The propulsion generators will supply power to an 1800-horsepower, 90 revolutions per minute, 750-volt, double motor on each boat, direct connected to the propeller shaft.

The tankers will be fitted with electric auxiliaries all of which will be driven by General Electric motors. These auxiliaries will include two 80-horsepower cargo pumps, one 45-horsepower windlass, one 30-horsepower mooring winch, one 30-horsepower fire and bilge pump, two 15-horsepower air compressors, and a 25-kilowatt auxiliary generator driven by an oil engine for emergency use in port.

News of the Month from the Shipyards

KEEL LAYINGS

Carfloat for Lehigh valley railroad by Federal Shipbuilding and Drydock Co., July 21.

Motor tanker for California Petroleum Company by Sun Shipbuilding Company, July 5; two carfloats for Pennsylvania Railroad, June 30.

Stern-wheel towboat for International Petroleum Corp., for Magdalena River, Aug. 4.

LAUNCHINGS

Dixie, passenger and freight steamer for Southern Pacific Steamship Lines by Federal Shipbuilding and Drydock Co., July 29.

Wharf boat for Minneapolis by Marietta Manufacturing Company, in July; wharf boat for Dubuque, during July.

Two deck barges for stock by Nashville Bridge Co., July 22, Aug. 2.

Socony 5, steam tug by Staten Island Shipbuilding Co., Aug. 12.

Axtell J. Byles, single screw bulk

(Continued on Page 444)

DIAPHRAGM
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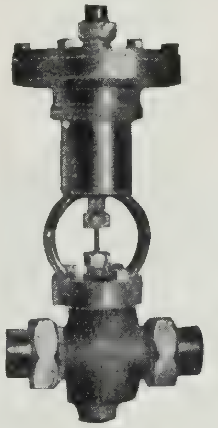
For Marine Pumps



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Progress of Construction

Pacific Coast

BALLARD MARINE RAILWAY CO., INC.,

Seattle, Wash.

Not named, hull J 89, yacht for E. Michelsen, Seattle; 44 L.B.P.; diesel eng.

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT

Potrero Works. San Francisco

Purchasing Agent: O. W. Streett.

Seven steel dredge hulls for U. S. Smelting & Refining Co., Oakland, Calif.; 140 ft. long; 10 cu. yards capacity.

GENERAL ENGINEERING & DRY-DOCK CO.,

Alameda, California

Purchasing Agent: Al. Wanner.

Hulls 7-11 inc., 5 wooden gravel barges for Pacific Portland Cement Co.; 106 L.B.P.; 32 beam; 9′4″ depth.

J. C. JOHNSON'S SHIPYARD

Port Blakely, Wn.

Hulls 120-121, two scows for stock; 100x36x8′8″; launched June 21 and 24/7.

THE MOORE DRY DOCK COMPANY

Oakland, California.

Secretary and Purchasing Agent, Nat Levy.

Hull 174, steel carfloat for Southern Pacific Co.; 258 by 38 by 7′ 9″ loaded draft; 14 cars capacity; keel June 20/27.

PACIFIC COAST ENGINEERING CO.

Oakland. Calif.

Alki, hull No. 4, fireboat for City of Seattle; 123 L.O.A.; 26 molded beam· 7′ 6″ draft; 14 knots speed; seven 6-cyl. 300-H.P. Winton diesel engs.; keel July 7/27.

R. W. Atkinson, hull No. 5, dipper dredge hull for Hawaiian Dredging Co., Honolulu; launched June 30/27.

PRINCE RUPERT DRYDOCK AND SHIPYARD

Prince Rupert, B.C.

Emblem I., halibut fishing boat for P. Bruno; 54 ft. long, keel April 1/27; launched May 30/27; **delivered July 7/27.**

Zapora, halibut boat for Lars Voge; 61ft. long; keel May 1/27· **delivered July 7/27.**

Bertha G., fishing boat for Gammon & Watt; 54′ long, keel May 31/27; **delivered June 15/27.**

Scow for Rupert Marine Products Co., 58x22x4′ 6″; **launched July 14/27; delivered July 15/27.**

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY

Pittsburgh, Penn.

Purchasing Agent: W G. A. Millar.

Thirteen barges for Mississippi River Commission, Memphis; 130′x30′x7′6″; **4 delivered.**

Fifteen covered barges for Inland Waterways Corp., Washington, D.C.; 126′x33′x7′6″.

AMERICAN BROWN-BOVERI ELECTRIC CORP.

Camden, N. J.

Purchasing Agent. L. G. Buckwalter.

Hull 371, carfloat for Pennsylvania R.R. Co.; 185′x34′x9′6″; keel June/27; launch Aug./27 est.; deliver Sept./27 est.

Hull 372, same as above; keel June/27; launch Aug. /27 est.; deliver Sept./27 est.

THE AMERICAN SHIP BUILDING COMPANY

Cleveland. Ohio.

Purchasing Agent: C H Hirsching.

Carl D. Bradley, hull 797, self-unloading bulk freighter for Bradley Transport. Co.; 615 L.B.P.; 65 beam; 20 loaded draft; 14 mi. speed; 13,000 D.W.T.; turbo-electric drive; 4000 I.H.P.; 2 water tube boilers; 325 lbs. pressure; keel Jan. 10/27; launched Apr. 9/27; **delivered July 28/27.**

Harry Coulby, hull 798, bulk freighter for Pickands, Mather & Co.; 607′ L.B.P.; 65′ beam; 33′ loaded draft; 13 mi. speed; 13,800 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 B. & W. boilers; 200 lbs. pressure; keel Feb. 7/27; launched April 30/27.

Not named, hull 799, tug for Michigan Limestone & Chemical Co., 83′6″ L.B.P.; 24 beam; 12 draft; 12 mi. speed; compound engs. 900 I H.P.; 1 fire tube boiler, 160 lbs. pressure; keel Mar. 1/27 est.; launch Apr. 9/27· **delivered May 28/27.**

Not named, hull 800, bulk oil barge for Standard Transportation Co.; 258 L.B.P.; 40 beam; 10 draft; keel Mar. 21/27 est.; launch Aug. 7/27 est.· deliver Aug. 15/27 est.

Not named, hull 801, oil barge for Standard Transportation Co., sister to above; keel Mar. 21/27; launch Aug. 7/27 est.; deliver Aug. 15/27 est.

Not named, hull 802, tank steamer for Standard Oil Co. (Indiana); 373 L.B.P.; 52 beam; 20 loaded draft; 12 mi. loaded speed; 6200 D.W.T.; 1800 I.H.P. triple expansion engs.· 2 Scotch boilers, 15′x4½″x11′6″x180 lbs. pressure.

Not named, hull 803, motor tanker, owners not named; 334 L.B P.; 51 beam; 18 loaded draft; 11½ mi. loaded speed; 3700 D.W.T.; 1900 I.H.P. diesel engs.; aux. Scotch boiler.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT

Quincy, Mass.

Lexington, hull 1300, airplane-carrier U.S.N., launched Oct. 3/25.

Hull 1402, carfloat, N.Y., N.H. & Hartford R.R.; 360′x40′x11′6″; 1375 gro. tons; keel July 14/26.

Hull 1403, carfloat, same as above; keel July 15/26.

Hull 1404, carfloat, same as above; keel July 16/26.

Hull 1405, carfloat, same as above; keel July 16/26.

Hull 1406, oil barge for City Service Transport Co. 204′x35′6′x14′3″.

CHARLESTON DRY DOCK AND MACHINERY COMPANY,

Charleston, S. C.

Purchasing Agent: Charles R. Valk.

One lighter for stock.

COLLINGWOOD SHIPYARDS, LTD.

Collingwood, Ontario.

Purchasing agent: E. Podmore.

Sand Merchant, hull 79, sand carrier for Interlake Transportation Co, Ltd., Montreal; 252 L.B.P.; 43′6″ beam; 2200 D.W.T. on 14′ draft; T.E. engs., 700 I.H.P.; 2 Scotch boilers, 13′ diam.; keel Apr. 28/27; launch Aug. 17/27 est.

CONSOLIDATED SHIPBUILDING CORPORATION

Morris Heights, N. Y.

Hull 2872, cruiser for B. H. Borden; 95 x 16 ft.; 2 Model R Speedway engs., 300 H.P. ea.

Hull 2874, cruiser for Clifford V. Brokaw; 85x 14 ft. 6 in.; 2 Model R. Speedway engs. 300 H. P. each.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.

Philadelphia. Pa.

Purchasing Agent: Ed. C. Geehr.

Malolo, hull 509, express psgr and frt liner, Matson Navigation Co.; 582 LOA; 577 length at water line; 83 ft beam; depth molded to C deck 54 ft.; displacement 22,050 tons; **8250 DWT;** speed 22 knots regular, **23 knots maximum; 35,000 shaft horsepower;** Cramp-Parsons turbines; oil burning B & W water-tube boilers; **keel May 4/25;** launched June 26/26.

Yarmouth, hull 518, twin screw passenger and **freight steamer for Eastern Steamship Lines; 378 length at water line;** 55-6 beam; 29-6 molded

WM. CORNFOOT, President GEO. RODGERS, Sec'y-Treas.

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depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears, six single-ended Scotch boilers; keel Feb. 23/26; launched Nov. 6/26; **delivered July 7/27.**

Evangeline, hull 524, twin screw passenger and **freight steamer for Eastern Steamship Lines; 378 length at water line; 55'6" beam; 29'6" molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears; 6 single-ended Scotch** boilers; keel May 1/26; launched Feb. 12/27; deliver Sept. 1/27 est.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

Purchasing Agent: G. O. Williams.

Comoco, hull 122, steel yacht for R. W. Judson, Detroit; 140' L.B.P.; 23'6" beam; 8'9" loaded draft; 15 mi. speed; 260 D.W.T.; 600 I.H.P. diesel engs.; keel Dec. 15/26; launch May 21/27 est.; deliver June 1/27 est.

Helen, hull 121, steel yacht, for Chas. E. Sorensen, Detroit; 105 L B.P.; 17' beam; 6' loaded draft; 13 mi. speed; 110 D.W.T.; 200 I.H.P. diesel engs.; keel Nov. 1/26; launch May 24/27 est.

Grathea II., hull 124, yacht for E. T. Strong, Flint, Mich ; 57'x13'x4'; 13 mi. loaded speed; 22 D.W.T.; 200 I.H.P. gas engs.; keel Aug. 1/27 est.. launch and deliver Apr. 1/28 est.

DRAVO CONTRACTING COMPANY
Pittsburgh, Pa.

Hull 538, steel whirler boat hull for Contracting Dept.: 40x48x5'6"; 100 gro. tons.

Hull 578, one dump scow for Pittsburgh Plate Glass Co : 110x26x8 ft. 6in.; 220 gro. tons. ea

Hulls 586-590 inc., 4 standard steel barges for stock; 100x26x6 ft. 6 in.; 135 gro. tons each.

Hulls 591-600 inc., 10 standard steel barges for stock, 100x26x6ft. 6in.; 135 gross tons each.

Hulls 602-604 inc., 3 steel barges for Keystone Sand & Supply Co.; 135x27x8ft.; 320 gr. tons ea.

Hulls 605-612 inc., 8 steel barges for Keystone Sand & Supply Co.; 135 x 27 x 8ft.; 320 gr. tons each.

Hull 613, steam dredge for stock; 120'x32'x6'; 200 gr. tons each.

Hulls 615 and 616, two 120-H.P. stern wheel diesel towboats for stock; 74ft. 2in. x 16 ft. x 4 ft.; 320 gro. tons ea.

Hulls 621-626 inc., six covered oil barges, steel decks, for International Petroleum Co., Montreal; 100'x30'x6'6"; 180 gro. tons ea.

Hulls 632-634 inc., three complete maneuver hulls for U S. Engineers, Pittsburgh; 93 gro. tons ea.

Hulls 635-644 inc., ten covered steel barges for Inland Waterways Corp., Washington, D.C.; 126x33x7'6"; 485 gro. tons ea.

Hulls 652-653, two steel deck scows for U. S. Engineer Office, Philadelphia; 102x30x10 ft.; 400 gro. tons ea.

DUBUQUE BOAT & BOILER WORKS
Dubuque, Iowa

Purchasing Agent: A. L. Yehger.

Thorpe, river towboat for Upper Mississippi Barge Line Co. & Inland Waterways Corp.; 132'x35'x3'6"; stern wheel, tandem comp. surface condensing engs.; 15"x30"x78" stroke; keel Oct. 1/26 est.; launch Mar. 1/27 est.; deliver Apr. 1/27 est.

Weber, river towboat, sister to above; keel Oct. 1/26 est.; launch Mar. 1/27 est.; deliver Apr. 1/27 est.

Morse, river towboat, sister to above; keel Oct 1/26 est; launch Mar. 1/27 est; deliver Apr. 1/27 est.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent: R. S. Page.

Dixie, hull 89, passenger and freight steamer **for Southern Pacific Steamship Lines, Pier 49, North River, New York; 427 L.B.P.; 60 beam; 25'6" loaded draft; 6700 D.W.T.; De Laval steam turbines; 7700 S.H.P.; 4 B. & W. boilers, 21,900 sq.** ft. heating surface; 16,000 sq. ft. superheating surface; keel Jan. 31/27; **launched July 29/27.**

Hull 90, carfloat for Lehigh Valley Railroad 278x39x10ft.; keel Apr. 18/27; **launched July 15/27; delivered July 16/27.**

Hull 91, same as above; keel May 10/27.

Hull 92, same as above; keel June 6/27.

Hull 93, carfloat for D. L. & W. Railroad, 278 x39x10ft.; keel June [illegible]/27.

Hull 94, same as above; **keel July 21/27.**

Hull 95, same as above.

Hulls 96-99 inc., four carfloats for the Pennsylvania Railroad.

GREAT LAKES ENGINEERING WORKS
River Rouge, Mich.

Purchasing Agent: Chas. Short.

S. T. Crapo, hull 256, bulk cement freighter for Huron Transportation Co.; 385 L.B.P.; 60 beam; 19 loaded draft ;11 mi. speed; 7200 D.W.T.; T.E. engs.; 1800 I.H.P.; 3 Scotch boilers, 12 ft. 9 in. diam.; keel April 12/27; launched July 7/27; deliver Sept. 15/27 est.

HOWARD SHIPYARDS & DOCK COMPANY
Jeffersonville. Ind.

Purchasing Agent. W. H. Dickey.

Hull 1601, hull for Baton Rouge Car Terminal, Baton Rouge, La.: 285'x60'x9'6"; keel Mar. 30/27; launched July 9/27; deliver Aug. 1/27 est.

Hull 1605, steel barge for U. S. Army Engineers, St. Louis; 55x16x3ft.; keel May 3/27.

Hull 1606, same as above; keel May 16/27.

Hull 1607, same as above; keel May 16/27.

Hull 1608, same as above; keel May 18/27.

Hull 1609, same as above, keel May 18/27.

Hull 1610, same as above; keel May 27/27.

Hull 1611, same as above; keel June 15/27; launch and deliver July 21/27 est.

Hull 1612, same as above; keel June 15/27; launch and deliver July 21/27 est.

Hull 1613 same as above; keel June 15/27; launch and deliver July 21/27 est

Hull 1614, same as above; keel June 17/27; launch and deliver July 21/27 est

Hull 1615, same as above.

Hull 1616, same as above.

Hull 1617, same as above

Hull 1618, same as above.

Hull 1619, same as above.

Hull 1620, same as above.

Hull 1621, same as above.

Hull 1622, same as above.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Purchasing Agent: H. Meyer.

Hull 227, one car ferry for Grand Trunk Milwaukee Car Ferry Co.; 360' L.O.A.; 58' molded beam; 21'6" depth; 2 T.E. engs.; 4 Scotch boilers; launch Jan. 19/27 est.; deliver Mar. 1/27 est.

MARIETTA MANUFACTURING COMPANY
Point Pleasant. W. Va.

Purchasing Agent: S. C. Wilhelm.

One steel stern-wheel towboat for Magdalena River, Colombia; 168' x 42' x 5'; tandem compound engs.; keel laid; **delivered July 18/27.**

Wharf boat for city of Dubuque, Iowa; **214x45x** 6ft. 6in.; keel May 11/27; **launched.**

Wharf boat for Minneapolis; 214x45x6ft. 6in.; keel May 26/27; **launched.**

Wharf boat for St. Paul, 214x45x6ft. 6in.; keel May 30/27.

Stern-wheel towboat for Magdalena River, Colombia; 168'x42'x5'. **keel Aug. 4/27.**

Sternwheel towboat; sister to above; keel Nov. 1/27 est.

Eight steel hoppered cargo barges for Magdalena River, Colombia; 125'x26'x6'

MIDLAND BARGE COMPANY
Midland, Pa.

One dredge hull for River Sand Co.; 131x30x5ft.

Four sectional dry-docks for International Petroleum Co. of Montreal; 70x44ft.; **launched.**

One steel flush deck barge for Dillman Egg Case Co.; 180'x36'x7'.

Fifteen cabin barges for Inland Waterways Corp., Washington, D.C.; 126x33x7'6".

Five barges for Inland Waterways Corp., 126'x33'x7'6".

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Purchasing Agent: R. S. McLaughlin.

Saskatoon, hull 20, package freighter for Canada Steamship Lines, Ltd.; 250 L.B.P.; 42 beam; 26ft. 6in. draft; keel Jan. 18/27; launched June 8/27; **delivered July 26/27.**

NASHVILLE BRIDGE COMPANY

Nashville, Tenn.

Purchasing Agent: Leo E. Wege.

Hull 108, dredge, McWilliam Dredging Co., clam shell bucket type; 110'x51'6"x8'; steam eng.; keel July 10/27;; launch Sept. 1/27 est.

Hull 121, deck barge for stock; 140 L.B.P.; 32 beam; 6 loaded draft; keel June 15/27; deliver beam; 6 loaded draft; keel June 15/27; **launched July 22/27.**

Hull 122, deck barge, same as above; keel June 15/27; **launched July 27/27.**

Hull 123, deck barge, same as above; keel June 15/27; **launched Aug. 6/27.**

Hulls 124-127 inc., four deck barges for stock; 130x32x8ft.; **keels July 25/27; Aug. 5/27;** Aug. 15/27 est.

Hull 128, steel steamboat hull, owner not named; 96 L.B.P.; 24 beam; 4* loaded draft; keel Aug. 18/27 est.

Hull 129, steel deck barge; 100x24x5ft.; keel Aug. 15/27 est.

Hull 130, same as above; keel Aug. 15/27 est.

Hull 131, steel barge, 56x12x2½ ft.; **delivered July 28/27.**

Hull 132, deck barge, for stock; 100 L.B.P.; 24 beam; 5 loaded draft; keel Sept. 15/27 est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas: Plummer, 233 Broadway New York City.

Shawnee, hull 307, passenger and freight steamship for Clyde Steamship Company, New York, 407'-3" overall, 62'-0" beam, 30'-6" depth, Newport News turbines and gear; 8500 I.H.P.; Scocth boilers, oil burning; keel May 15/26; launched Apr. 18/27; **delivered July 21/27.**

California, hull 315, 18-knot, passenger liner for Panama Pacific Line, New York; 600 ft. long, 80 ft. beam, 52 ft. depth; watertube boilers for oil 22,000 gross tons; 17,000 I.H.P.; keel Mar. 20/26; launch Oct./27 est.

Caracas, hull 319, passenger and freight steamer for Red D Line, New York; 335'4" L.O.A.; 51' beam; 22' draft; Newport News turbines and gears; water-tube boilers; 3560 D.W.T.; 4000 S.H.P.; keel Nov. 18/26; launched June 30/27; deliver Aug. /27 est.

Hull 321, barge for Merritt, Chapman and Scott Corp.; 154x50x13ft.; launch Aug. /27 est.; deliver Aug./27 est.

Not named, hull 323, light cruiser for United States Navy, 10,000 tons displacement.

Not named, hull 324, light cruiser for United States Navy; 10,000 tons displacement.

Not named, hull 325, bay steamer for Chesapeake Steamship Co.; 277' long; 53' beam; 18' depth; keel Oct./27 est.

Not named, hull 326, bay steamer for Chesapeake Steamship Co.; 289' long; 53' beam; 18' depth; keel Nov./27 est.

THE PUSEY AND JONES CORP.

Wilmington, Del.

Purchasing Agent; James Bradford.

Not named, hull 1031, single screw passenger freight steamer for Baltimore & Philadelphia Steamboat Co., Philadelphia; 219 L.B.P.; 45 beam; 11 loaded draft; 14½ mi. speed; 4 crank, TE engs, 21-32-35-35 by 24"; two B & W water-tube boilers, 3046 sq. ft. heating surface each.

Not named, hull 1034, steel twin-screw diesel yacht from Henry J. Gielow, Inc., naval architect, New York, 294' L.O.A.; 38'3" beam; 16' loaded draft; 2 Bessemer diesel engs.; total of 3000 H.P.; keel Apr. 1/27; launch Sept. 15/27 est.; deliver Jan. 1/28 est.

Not named hull 1035, night passenger and freight vessel for Baltimore Steam Packet Co., Baltimore, Md.; 320 L.B.P., 56'6" beam; 15'6" loaded draft aft; 18½ mi. speed; 1784 gross tons; 2600 I.H.P. 4-cyl. triple expansion engs.; 4 Scotch boilers, 13'8" diameter.

STATEN ISLAND SHIPBUILDING COMPANY

Mariner's Harbor, N. Y.

Purchasing agent: R. C. Miller.

Socony 1, hull 774, steam tug for Standard Transportation Co.; 100 ft. 2 in. L. B.P.; 24ft. 1in. beam; 12ft. 3in. depth; 15 knots speed; comp. engs. 850 I.H.P.; 1 Scotch boiler 14ft. 9in. dia. by 12ft.; keel Mar. 8/27; launched June 7/27; **delivered July 15/27.**

Socony 5, hull 775, steam tug, sister to above; keel Mar. 15/27; **launched July 8/27;** deliver Aug. 12/27 est.

SUN SHIPBUILDING COMPANY

Chester, Penn.

Purchasing Agent: H. W. Scott.

Axtell J. Byles, hull 104, single screw bulk oil steamer for Tidewater Oil Co.; 480' long; 65'9" beam, 37 feet depth; to carry 13,000 tons on 27'6" draft; speed 11½ knots; keel March 1/27; **launched June 11/27.**

Colonial Beacon, hull 105, motor barge for Beacon Oil Co., Boston; 255'6"x40'x15'; two 360 H.P. Fairbanks-Morse diesel engs.; keel laid Mar. 7/27.

Not named, hull 106, motor tanker for Sun Oil Co.; 480'x65'9"x37'; 13,000 D.W.T.; 2800 S. H.P. at 80 R.P.M.; 4 cyl., 2-cycle Sun Doxford engs.; keel May 2/27.

Not named, hull 107, tanker for California Petroleum Co.; 510'x70'x40'; 17,000 D.W.T.; 4500 S. H. P. at 82 R.P.M., 8-cyl, 2-cycle Sun-Doxford eng ; **keel July 5/27**

Hull 108, carfloat for Pennsylvania Railroad; 330'x38'x10'6"; **keel June 30/27.**

Hull 109, same as above; keel **June 30/27.**

TOLEDO SHIPBUILDING CO.

Toledo, Ohio.

Purchasing Agent: Otto Hall.

B. F. Affleck, freighter, hull 178, for Pittsburgh Steamship Co.; 580 L.B.P.; 60' beam; 19' loaded draft; 12½ mi. speed; 12,500 D.W.T.; T.E. engs.; 2500 I.H.P.; 3 Scotch boilers; 14' diam; keel Feb. 1/27; launched June 25/27; deliver Aug. 15/27 est.

TODD DRYDOCK & ENGINEERING REPAIR CORP.

Brooklyn, N. Y.

Purchasing Agent: H. J. Shannon.

Greenwich Village, hull 40, diesel-electric ferryboat for Dept. of Plant & Structures, City of New York; 101 ft. 6 in. length over guards; 27 ft. 7 in. beam; 6 ft. 8¾ in. loaded draft; 300 I.H.P. Nelseco diesel engine; keel Apr. 14/27; **launched July 19/27.**

Mott Haven, hull 41, diesel-electric ferryboat, sister to above; keel Apr. 14/27; **launched July 19/27.**

THE CHARLES WARD ENGINEERING WORKS

Charleston, W. Va.

Purchasing Agent: E. T. Jones

Hull 59, steel barge for W. C. Kelly Barge Line; keel May 13/27; **launched July 25/27; delivered July 30/27.**

W. A. Shepard, hull 60, towboat for W. C. Kelly Barge Line; screw propeller, 2 Fairbanks-Morse diesel engs.; 720 B.H.P.; keel Sept. 23/26; launched Jan. 11/27; **delivered Apr. 15/27.**

Duncan Bruce, hull 61, stern-wheel towboat, for W. C. Kelly Barge Line; 135'x35'x6'; Fairbanks-Morse diesel engs.; keel Jan. 17/27; launched May 2/27; **delivered July 15/27.**

F. H. Hilliard, hull 62, diesel powered stern wheel survey boat for Mississippi River Comm., Dredging Dist., Memphis Tenn.; 139'6"x24'x5'3"; keel June 2/27.

Not named, hull 63, steel hull diesel-electric stern wheel towboat for U.S. Engineers, St. Louis; 110x23x5 ft.

Hull 64, steel hull inspection boat for U. S. Engineers, New Orleans; 85x18x7ft.; diesel eng., single screw.

Repairs

BETHLEHEM SHIPBUILDING CORP., LTD., UNION PLANT.

Drydock, paint misc. repairs: stmr. Colombia, tug Governor Markham, Manchuria, State Dredge No. 3, stmr. Capt. A. F. Lucas, U.S.S. Mississippi, m.s. Seekonk, stmr. Harvard, m.s. City of Panama, stmrs. Elkridge, Eleanor Christenson, m.s. H. T. Harper, schs. Whitney Olson, Katherine, San Diego, Geo. L. Olson, Horace X. Baxter, ferry Chas. Van Damme stmr. Richmond, Pacific Coast Dredge No. 3, stmrs. Mongolia, Harvard. Tailshaft repairs: Horace X. Baxter, m.s. Seekonk. Propeller repairs: schr. Jane Nettleton, Mahukona, stmr. Makaweli, Pennsylvanian, Johan Poulsen. Drydocked for survey, repairs: schr. Jane Nettleton, Washington. Boiler repairs: stmrs. Rose City, Andrea F. Luckenbach. Pump repairs: stmr. Shintoka Maru. Engine repairs: stmr. Newport, m.s. Geisha, yacht Invader, stmr. Kilauea. Misc. repairs: Nebraskan, American, Catherine G. Sudden m.s. Missourian, barge Petroleum No. 3, stmr Virginian, Actor, Shell Barge No. 5, schr. Yellowstone, Makura, stmrs. Alvarado, Willfaro, President Taft, Wilhelmina, Hycania, La Brea, Java Arrow, Emma H. Coppage, Nora, Point Montara, Algonquin, Socony, Barge Socony 88, stmrs. W. S. Rheem, Deroche, yacht Poinsettia, stmrs. Liberator, Limnea, Los Angeles, E. T. Bedford, Edward Luckenbach, tug Peacock, schr. Noyo, stmrs. Silver Shell, Tejon, Levant Arrow, Manalei West Mahway, Surtorpco, schrs. Frank D. Stout, Daisy Matthews, Daisy, stmr. Malama, schr. Santa Inez, Ernest H. Meyer, tug Chief.

CHARLESTON DRY DOCK & MACHINERY COMPANY,

Charleston, S.C.

General repairs: dredge Gilmer, tug Brannan. Renew about 60 plates on bottom of lighthouse tender Mangrove.

COLLINGWOOD SHIPYARDS, LTD.,

Collingwood, Ont.

Side damage repairs, tail shaft drawn and stern bearing relined: stmr. Midland King. New shoe fitted and rudder stock straightened: stmr. Michipicoten. Bottom damage repairs: stmr. Emperor.

GENERAL ENGINEERING AND DRY DOCK CO.,

Alameda, Calif.

Drydock, clean, paint, minor damage repairs: ferry Golden State, stmr. Coalinga schr. Annie Christenson (general repairs), ferry San Jose (general repairs, sponsoned under contract), yacht Idalia, ferry City of San Rafael. General repairs: Helen P. Drew, American Star, ferry Golden Gate, m.s. Iris A. Straighten rudder stock: ferry Golden Bear. Drydock, clean, paint: yacht Elia.' Drydock: yacht Navigator, stmr. San Antonio (new tailshaft). Drydock, minor repairs: tug Roland. Drydock, wheel repairs, new starboard tailshaft: stmr. Oakland. Minor repairs: ferry Harry E. Speas. Vessels mentioned last month still undergoing repairs: stmrs. Phyllis, W. R. Chamberlin, Jr.

HANLON DRYDOCK & SHIPBUILDING CO.,

Oakland, Calif.

Purchasing Agent: Ralph T. Barker.

Drydock, general overhaul: C. D. Johnson III. Jacox. Damage repairs to hull: Edna Christenson, Star of Chile. Drydock, new keel, new garboards, caulking all over: stmr. Boobyalla. Install new winches: stmr. Corsicana. New telemotor steering gear; new booms and cargo handling: stmr. Sabotawan.

PRINCE RUPERT DRYDOCK AND SHIPYARD,

Prince Rupert, B.C.

Docked, cleaned, painted: dredge Lion. Docked, broken propeller removed and new one installed, tail shaft drawn for inspection and replaced: Chilkoot. Docked, cleaned, painted, misc. hull and machinery repairs: 14 fishing boats. Docked, cleaned, painted: 4 scows. Misc. hull and engine repairs: 46 fishing boats. 78 other commercial jobs.

TODD DRY DOCKS, INC.,

Seattle, Wash.

Drydock, clean, paint: stmr. Aleutian, German cruiser Emden (also misc. repairs). Major alterations and reconditioning: stmr. Comfort. Hull repairs: stmr. Romulus. Misc. repairs: stmrs. Absaroka, Admiral Rogers, Contra Costa, Remus.

U.S. NAVY YARD,

Bremerton, Wash.

Docking: Stoddert, Paul Hamilton, Reno. Drydock, misc. repairs: New Mexico, California, Kennedy, Mullany, Farragut, William Jones. Misc. repairs incidental to operation as district craft: Mahopac, Swallow, Challenge, Pawtucket, Sotoyomo, Tatnuck.

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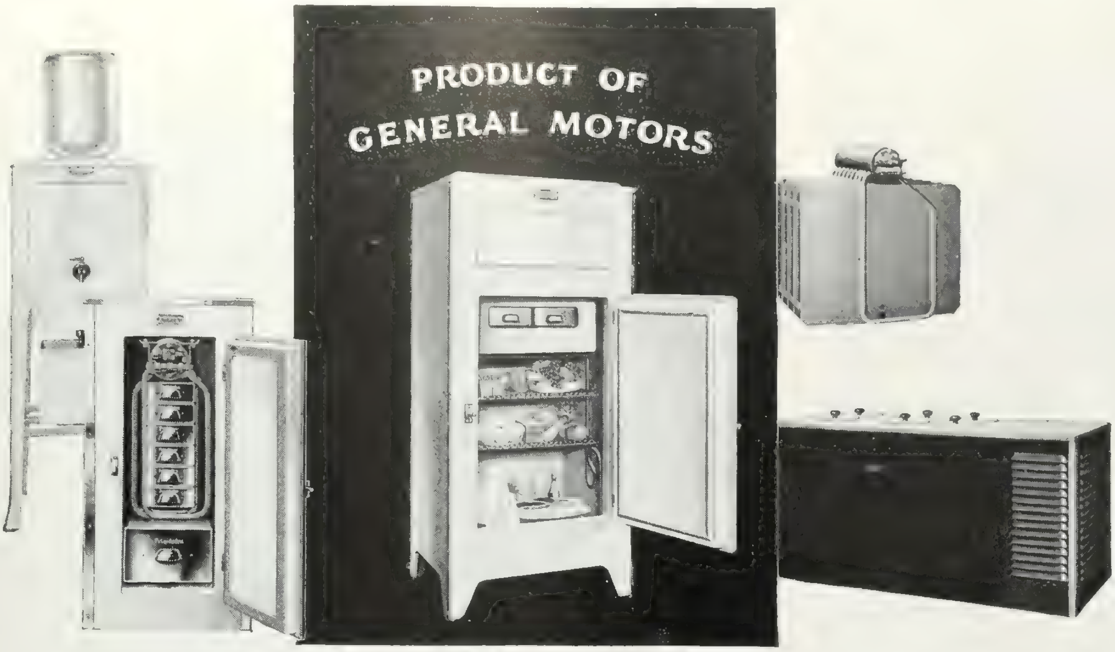

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provides better refrigeration wherever food is served

The smallest yacht or the largest vessel can enjoy the benefits of dependable electric refrigeration.

FRIGIDAIRE'S wide adaptability accounts, in large measure, for its predominance in the field of electric refrigeration. The extremely wide range of models and possible combinations meet practically every need in the preservation of foods.

Thirteen self-contained cabinets range in size from five to fifteen cubic feet food storage capacity. Frigidaire mechanical units will convert the smallest ice-box or the large walk-in cold room with equal efficiency. They are widely used to cool freezer counters.

In soda fountain equipment, Frigidaire makes ice unnecessary. But in case ice is desired for any purpose, the Frigidaire Ice Maker provides it—twenty to sixty pounds of convenient-sized cubes in a few hours.

Frigidaire Ice Cream Cabinets automatically maintain the extremely low temperatures required to keep ice cream.

The Frigidaire line of water coolers is especially complete—meeting the demand for cool drinking water in any quantity required.

The advantage of a line as comprehensive as Frigidaire's is its flexibility. Unusual refrigeration problems are constantly being met and solved—unusual purposes served by the dependable, automatic, economical refrigeration afforded by Frigidaire.

The Frigidaire representative is a refrigeration expert. Send for him, or write direct to us for any specific information about refrigeration.

FRIGIDAIRE CORPORATION, Subsidiary of General Motors Corporation, Dept. O-81, Dayton, Ohio

News of the Month from the Shipyards

(Continued from page 439)

oil steamer for Tidewater Oil Co., by Sun Shipbuilding Co., June 11.

Greenwich Village and Mott Haven, diesel-electric ferryboats for the City of New York by Todd Drydock, Engineering & Repair Corp., July 19.

DELIVERIES

Emblem I, halibut fishing boat for P. Bruno by Prince Rupert Drydock and Shipyard, July 7; Zapora, halibut fishing boat for Lars Voge, June 7; Bertha G, fishing boat for Gammon & Watt, June 15; scow for Rupert Marine Products Co., July 15.

Four barges for Mississippi River Commission by American Bridge Co., July.

Carl D. Bradley, self-unloading bulk freighter for Bradley Transport Co., by American Ship Building Company, July 28.

Yarmouth, twin screw passenger and freight steamer for Eastern Steamship Lines by Wm. Cramp & Sons Ship and Engine Building Co., July 7.

Carfloat for Lehigh Valley Railroad by Federal Shipbuilding and Drydock Co., July 16.

Stern-wheel towboat for International Petroleum Co., for Magdalena River, by Marietta Manufacturing Co., July 18.

Saskatoon, package freighter for Canada Steamship Lines, Ltd., by Midland Shipbuilding Co., July 26.

Shawnee, passenger and freight steamship for Clyde Line by Newport News Shipbuilding and Drydock Co., July 21.

Steel barge for W. C. Kelly Barge Line by The Chas. Ward Engineering Works, July 30; W. A. Shepard and Duncan Bruce, towboats for W. C. Kelly Barge Line, July 15.

REPAIRS

Craig Shipbuilding Company, Long Beach, California, will recondition the motorship Mazatlan which has been laid up at San Francisco for the past two years. John F. Craig directed the movement of the vessel to Long Beach.

Todd Dry Docks Inc., Seattle, received the contract from the Pacific Steamship Company for damage repairs to the steamship Admiral Watson, which went aground near Prince Rupert early in August.

This company recently completed repairs to the steamer Remus costing $50,000. The vessel was recently sold by the Latin-America Line to the Norwegian-American Line.

The Transmarine Corporation of New York decided to scrap the steamship Suremico after her collision with the steamship Arkansas recently off Tatoosh Island. The rigging, masts, booms, winches, and other equipment were removed from the vessel at the plant of the Pacific Coast Engineering Company, Seattle, and shipped to Newark on the Transmarine Line freighter Sudawsonco. The engines will be shipped to the home port later.

The motor freighter Challamba, another vessel to suffer severe damage recently on the Pacific Coast, is tied up at Victoria, and is offered for sale "as is" by Lloyds. The vessel went aground on Whitecliff Island, near Prince Rupert, in June, and the lowest estimate for repairs was $120,000. The owners have therefore declared her a constructive total loss.

* * *

The Todd Shipyards Corporation will build a new drydock for its New Orleans unit on the west bank of the Mississippi River opposite the City of New Orleans. The project will cost about $500,000, and work will commence as soon as the water level is reduced to normal.

* * *

The fourth consecutive barge has been completed by the William Muller's shipyard for the Wilmington Transportation Company, Wilmington, California. The barge is of wooden construction, 120 by 45 feet, and brings the Wrigley fleet up to fourteen barges, including two floating derricks. Included in the fleet also are ten tugs, four steamers, and a large number of glass-bottom boats.

* * *

We are informed that the Canadian Government Merchant Marine plans the establishment of a steamship line between Vancouver and ports on the West Coast of South America and Mexico, including Mazatlan, Manzanillo, Calloa, and Valparaiso.

* * *

Mont Louis Steamship Co., Ltd., of Montreal, has been incorporated under the Quebec Companies Act with an authorized capital of $300,000 for the purpose of transporting passenger and freight, and to do towing, wrecking, and salvaging, and to own and operate ship yards, docks, wharves, warehouses, etc. M. E. Grivell of Montreal is one of the incorporators.

* * *

Kruse and Banks, boat builders of North Bend, Oregon, recently completed the patrol boat Teal for the U. S. Bureau of Fisheries for use in Alaskan waters. The vessel is powered with Washington-Estep diesel engines of 150 horsepower, is 78 feet long, and 18 feet beam. Coolidge & Hansen of Seattle are the designers.

* * *

The Pusey & Jones Corporation of Wilmington, Delaware, will have Clement C. Smith of Milwaukee for its president to fill the place of the late William G. Coxe.

* * *

The Olympic Motorboat Corporation of Seattle is enlarging the capacity of its plant to take care of a large order for 120 standard cruisers for California interests. The cruisers were designed by L. E. Geary, naval architect of Seattle. They will be 28 feet long and will be powered with Ford marine engines built in Ford, Ontario. George I. Briggs is president of the Olympic Motorboat Corporation; G. F. Johnson, vice-president, and R. J. Henry, secretary-treasurer. The yard builds other sizes and types of cruisers.

Lieutenant W. M. Hague and A. R. Fenton of Bremerton, Washington, are at present at the Mare Island Navy Yard in connection with the steel schedules for the light cruisers Nos. 28 and 29, which will be built by these yards.

Contracts for the construction of scout cruisers Nos. 26 to 31, inclusive, were signed on June 13 by Secretary Wilbur. Bethlehem Shipbuilding Corp., Fore River Plant, will build No. 26; American Brown Boveri Electric Corp., will build No. 27, and Newport News Shipbuilding and Drydock Co. will build Nos. 30 and 31.

The three contracting shipbuilders have organized a corporation known as the Marine Engineering Corporation, with offices in the Steele Building, Philadelphia, where a force of engineers, naval architects, and draftsmen have been assembled. The nucleus of this staff is made up from the force formerly with Wm. Cramp & Sons shipyard. A purchasing staff also has been established for the purpose of negotiating with various manufacturers of marine machinery and equipment with a view to the placing of identical contracts by the three builders for machinery, auxiliaries, etc. The yards expect to obtain the greatest degree of uniformity in the construction of these vessels by the employment of a centralized staff for the development of the plans and the preparation of purchases.

The Navy Department Bureau of Construction and Repair and the Bureau of Engineering will also maintain offices in connection with the Marine Engineering Corporation. Captain William P. Robert and Commander Albert M. Penn will be in charge.

* * *

Allan Cunningham, Seattle, Washington, builder of auxiliary machinery for marine and stationary installation, was awarded contract for the automatic electric towing machinery for one of the powerful diesel-electric towboats being built by the Panama Canal Commission at Balboa.

* * *

The Sumner type diesel engine will in the future be manufactured and marketed by the Willamette Iron and Steel Company of Portland, Oregon. Engines for small marine installations will be built, such as for fishing, towing and other workboat jobs.

H. C. Cantelow and Son

H. C. Cantelow.

FOR thirty-three years, H. C. Cantelow has worked for the progress of Pacific Coast shipping and for his own advancement in that business. On November 6, 1894, he entered the service of the Oregon Railway and Navigation Company on the old wooden wharf at the foot of Spear street, San Francisco, as office boy on the salary of $25 a month. Here young Cantelow, working hard long hours, progressed to the position of chief clerk.

In 1901 he joined the Panama Railroad Steamship Line as chief clerk and cashier. That company was then operating the steamers Hyades, Leelanaw, Enterprise, and other freighters between San Francisco and Panama, where New York freight was transferred by rail to their own Atlantic Coast passenger steamers. In 1903 the differences between the Panama Railroad and the old Pacific Mail Steamship Company were patched up and a new interchange agreement was made. Cantelow then joined the Pacific Mail in charge of freight booking, tariffs, and rate quotations.

In those days, the Pacific Mail Steamship Co. was operating to the Orient under joint schedule with the Toyo Kisen Kaisha and the O. and O. Steamship Company, with sailings each Saturday from San Francisco, also operating on weekly Saturday sailings to Mexican ports, Central American ports, and Panama. Practically all of the cargo moving from San Francisco to the Atlantic via the Isthmus of Panama, to Mexico and Central America, and to the Orient, was in those days personally booked by H. C. Cantelow. This fact brings out forcibly the tremendous growth in San Francisco's foreign trade during the past quarter century.

In 1906, Mr. Cantelow became chief assistant to the Pacific Coast manager of the Kosmos Line, Lendal M. Gray, then pioneering in the Pacific with some splendid German freighters. In 1907 he became general freight agent of the old Pacific Coast Steamship Company, then operating seven Pacific coastwise services, including one to the northern Mexican ports. When the Pacific Coast Steamship Company and the Admiral Line fleets were merged to form the present Pacific Steamship Company, Cantelow became freight traffic manager under the leadership of H. F. Alexander. In 1918 he was made assistant general manager and transferred to Seattle.

Mr. Cantelow was made Pacific Coast general manager of the Luckenbach Steamship Company in 1922 and shortly thereafter was made a vice-president of the company. These positions he held until May 1, 1927, when he resigned to form the firm of H. C. Cantelow and Son.

A noteworthy feature of this career is that every move made was by invitation and for financial betterment.

H. C. Cantelow was recently elected a director and vice-president of the San Francisco Chamber of Commerce. He was appointed chairman of the Transportation Committee, chairman of the Maritime and Harbor Committee, and a member of the Executive Committee. He is at the present time vice-president of the Pacific American Steamship Association.

The new firm opens with a great faith in the future of the Pacific Coast, a faith that envisions an enormous growth in population, in industries, and in production with a consequent increase in waterborne cargo and in shipping. They will specialize in efficient agency service for regular lines and will maintain offices in San Francisco, Seattle, and Portland.

The Alloys Company Agencies

AN extensive trip throughout the Northwest and Pacific Mountain states has just been completed by H. S. Shuey of The Alloys Company, a subsidiary of The Merrill Company. He reports that the following representatives have been appointed to handle the distribution of Merco pipe joint compound:

Gordon & Belyea, Limited, 157 Alexander street, Vancouver, B. C.; V. S. Jenkins Co., 1559 Railroad avenue, South, Seattle; Atlas Packing & Rubber Co., Pier 2, Seattle; The Beebe Company, 120 First street, Portland.

M. H. Newell, manager of The Alloys Company, is leaving in September for an extensive eastern trip, for the purpose of appointing agents throughout those territories where their products are not at present represented.

Ample Wharfage at Chief Ports

Everything essential for quick, efficient and careful transfer of freight is provided for at all McCormick Steamship terminals on the Pacific Coast. Ample wharfage and abundant facilities for swift loading, checking and delivery is assured our clients. Waste time and inconvenience are eliminated by the employment of experienced stevedores and capable checking clerks—a vital consideration.

Typical view of interior of large McCormick Dock.

New sailing schedule sent upon request

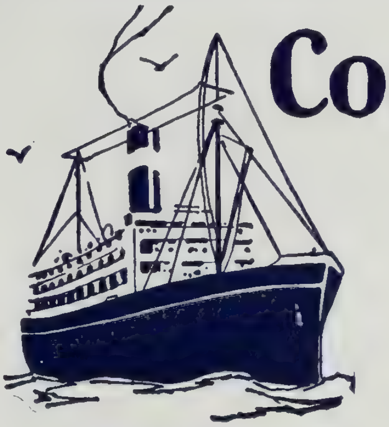
80,000
Miles of
Service

McCormick Steamship Company

215 MARKET STREET
SAN FRANCISCO
Davenport - 3500

Passenger
Freight
Lumber

LOS ANGELES OAKLAND PORTLAND SEATTLE TACOMA VANCOUVER, B. C.



Coast-to-Coast Service

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From San Francisco—Los Angeles			From New York—Cristobal		
*S.S. Corinto	Sept. 10	....	†S.S. Venezuela	Sept. 3	Sept. 13
†S.S. Colombia	Sept. 17	Sept. 19	*M.S. City of S.F.	....	Sept. 9
*M.S. City of Panama	Sept. 24	Sept. 26	†S.S. Ecuador	Sept. 24	Oct. 4
†S.S. Venezuela	Oct. 8	Oct. 10	†S.S. Corinto	....	Oct. 7
*M.S. City of S.F.	Oct. 15	Oct. 17	*S.S. Columbia	Oct. 22	Nov. 1

*Ports of Call—Mazatlan, Champerico, San Jose de Guatemala, Acajutla, La Libertad, La Union, Amapala, Corinto, San Juan del Sur, Puntarenas, Balboa and Cristobal.

†Ports of call—Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal and (Havana eastbound only), Cartagena and Puerto Colombia (Westbound only), and New York.

Through Bills of Lading to east and west coast ports of South America and to European Ports via New York.

Excellent Passenger Service to All Ports

PANAMA MAIL STEAMSHIP COMPANY

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Passenger and Freight Offices:
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PANAMA MAIL S.S. CO.

2 PINE ST.
San Francisco, Cal.
10 HANOVER SQUARE
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Steam Engineering Merger

GREAT interest has centered around the recent announcement of the consolidation of the Power Specialty Company and the Wheeler Condenser and Engineering Company. These two old established concerns have been producing the finest apparatus in their lines for the past twenty-five years, have been pioneers in many new engineering developments and are among the strongest and most highly respected of the manufacturers building auxiliary plant and oil refinery equipment.

The assets, plants, engineering, research, sales departments, and subsidiaries of both companies will now be assembled under one corporate identity to be known as the Foster Wheeler Corporation. No changes in products are contemplated as there has been no competition or overlapping of effort in the past. The products of each company complemented those of the other, but there is the great advantage that both were sold to the same industries and often to the same customers. The most widely known products of these companies —and they have been installed in every continent in the world—are superheaters, economizers, water cooled furnaces, air heaters, tube stills, unit coal pulverizers, condensers, pumps, cooling towers, feed water heaters, evaporators, fractionating equipment, and heat exchangers. These are built at Dansville and Newburgh, New York, at Cartaret, New Jersey, St. Catharines, Ontario, and at Egham, Surrey, England. The companies have branch offices throughout this country and subsidiaries in Canada and Europe. Thus, the combination of departments will effect valuable economies and the increased plant facilities with greater volume and buying power are certain to result in desirable savings.

No change in management will be made and former conservatism coupled with most advanced research and engineering will be maintained. The new officers will be those of the old companies as follows:

J. J. Brown, chairman of the board of directors; Pell W. Foster, vice-chairman and treasurer; L. B. Nutting, president; John Primrose, vice-president; H. S. Brown, vice-president; W. E. Dowd, Jr., vice-president; David McCulloch, secretary and general manager, and W. F. Keenan, Jr., chief engineer.

McCormick Promotions

RECENTLY two very important changes in personnel have been announced by the Chas. R. McCormick Lumber Co., and the McCormick Steamship Company.

John M. Hencken, formerly operating manager of the McCormick Steamship Company, has been promoted to the position of shipping manager of the Chas. R. McCormick Lumber Co., in which position he will have charge of the transportation needs of that concern as regards the movement of their products coastwise, intercoastally, and offshore. The movement involves several hundred million feet of lumber per annum.

Joseph A. Lunny, who was formerly assistant operating manager of the McCormick Steamship Company, has been promoted to the position of operating manager. He will have charge of the physical operation of the McCormick fleet of twenty-four vessels, operating in the coastwise, intercoastal, West Indies, and East Coast of South America trades. The McCormick Steamship Company also acts as agent for the Munson Steamship Line of New York, with which they are affiliated in the intercoastal trade, and the Redwood Line operating between Pacific Coast ports and the Gulf.

Mr. Hencken has been associated with the McCormick interests since the early part of 1914 in various capacities, and has been in charge of the operating department since 1918. Previous to this, he was connected with the firm of George E. Billings & Co. for eleven years.

Mr. Lunny first became identified with the company in San Francisco in 1918, and with the exception of a period of service that year in the United States Marines, has continuously been in the service of the company—in 1922 as terminal agent at Wilmington, in 1924 as assistant operating manager at San Francisco. He began his career with the Olson-Mahony Company in 1915, and when this corporation was dissolved, he continued with the Olson Steamship Company until his association with the McCormick interests.

Pacific Port Construction Notes

Martinez. Important development of the waterfront of Martinez to provide sites for industrial plants with deepwater facilities for vessels has been undertaken by the City of Martinez and by G. W. McNear, Inc., holders of waterfront property. The plans for this reclamation were drawn up by A. W. Pioda of San Francisco. The San Francisco Bridge Company has a contract from the City of Martinez for $69,000 and from G. W. McNear, Inc., San Francisco, for $116,000 for dredging and filling, which will turn this tule swampland into dry waterfront property. Other interests holding adjacent property who may soon join this project are the California Transportation Company, San Francisco, the Bacilleri Estate, and the Western Plywood Company.

San Francisco. The Board of State Harbor Commissioners now has an application from the Northwestern Pacific Railroad for permission to construct a ferry slip at the foot of Webster street.

Bids were opened August 17 by the Board of Harbor Commissioners for the reconstruction of Ferry Slip A at the Union Ferry Depot.

The Acme Construction Company submitted a low bid of $23,737.

An organization known as the San Francisco Produce and Provision Terminals, Inc., headed by W. H. Kearney, is seeking permission from the Board of State Harbor Commissioners and the City of San Francisco to construct a $6,000,000 terminal on the waterfront near the Army transport docks to house commission houses of all kinds. The terminal is to be financed by eastern capital.

Oakland. Due to the fact that the voters of Alameda failed to approve the ceding of Government Island to Oakland for removal, the Port Commission will find it necessary to draw up plans for the $3,000,000 piers in Brooklyn basin so as to develop this area without the removal of the island. Port Manager G. B. Hegardt is now preparing plans for this section of the harbor development.

Seattle. Major John S. Butler, U. S. District Engineer at Seattle, is preparing plans for $200,000 dredging and widening operations of Duwamish waterway.

The 500,000-bushel capacity addition to the Hanford Street grain elevator of the Port Commission was completed early in August in plenty of time for this year's shipments of grain. The addition comprises thirty-six circular and twenty-five interspace bins, which increase the capacity of the elevator from 1,000,000 to 1,500,000 bushels. The new bins are of reinforced concrete built on pile foundation.

Pier 5, owned by the J. C. Hayden Dock Company, will be extended by an open wharf 100 feet long and 145 feet wide, having double trackage facilities.

Safety Aboard Tankers

(Continued from Page 405)

another and know that the same set of signals is in use. This suggestion was offered the department by one of the masters.

Goggles of an approved type are supplied each vessel and instructions are issued which make it necessary for the personnel to wear goggles when carrying on such work as chipping or scaling, grinding tools or materials, welding, retinning, overhead painting, handling of acids, boiler compound, lye, or lye water. However, in spite of the fact that this measure is taken to protect the eyes, we have found individuals who refuse to wear them, while others will place the goggles over the forehead. Such men are warned, and if they do not then comply with the Safety First regulations they are discharged.

Gangways

You gentlemen are undoubtedly familiar with the slipshod manner of constructing and handling of gangways leading to and from ships from piers at shipyards and the danger attached thereto. In our standard repair specifications we include a clause which specifically states that gangways must be safe over which to handle equipment. They must also have side railings or ropes extending clear to the top. Our own gangways have side stanchions and ropes. The two top side stanchions are very close to the end, so as to safeguard a person right up to the time he steps on the deck. We have also found it necessary to remove the iron chafing strips on our gangways under each side piece and in their place to install hardwood. This is done so that there will be no possibility of a spark in case a gangway should be stretched across the bulwarks of two vessels lying alongside one another. The need of such a precaution on oil tankers is apparent. We have also installed at one end of each gangway iron clips which permit the end of the gangway to be quickly placed in position at either the bulwark or bead iron at the main or shelter deck, as the case may be, so that the individual immediately steps from the gangway to the deck without stepping up or down.

Fire Hazard

Fires constitute a great hazard on all ships, and especially is this true on oil tankers. For this reason no open lights of any description are permitted. Trucks which have iron wheels that might create sparks are forbidden. Only copper or wooden mallets are used in hammering up dogs, butterfly nuts, etc., around or in the near vicinity of cargo tanks. All loose electric cables in all living quarters have been installed in either a conduit or wire moulding. No loose electric cord is permitted anywhere except for a short section leading from the socket to an electric fan. Tankers are bonded electrically with pipe lines at terminals to eliminate the possibility of electric sparks.

Smoking is strictly prohibited on tank vessels during the loading and discharging of any products or while cleaning or gas freeing cargo tanks.

Fire hose is ranged on deck during the entire time that cargo is loaded or discharged, to be ready for instant use.

You gentlemen are familiar with water light cans, which are used in conjunction with life buoy rings to illuminate and show the location of a life buoy thrown overboard at night to help rescue some individual who has fallen overboard. You are also familiar with the construction of the can, especially at the top, where there is a small iron ring and iron cap. As a general rule the can hangs from the top pipe hand railing by means of either twine or wire wound round the hand railing and through the iron ring. This creates a fire hazard, as the iron ring wastes away, due to corrosion and the constant swinging motion, and leaves the can free to fall to the deck. If this happened on an oil tanker loaded with an inflammable cargo, where decks are more or less awash, it can be appreciated what might happen. To safeguard this condition we have developed a spring brass clip bracket which carries the weight of the can and its contents without the can being suspended by the ring. The bracket is designed and manufactured somewhat along the lines of the brackets which hold Pyrene fire extinguishers in an automobile.

An interesting Safety First feature has been developed and may be noted in the improved type of rat guard used on many ships. With the old type of rat guard, the seamen had to climb over the bow or stern, out on to the mooring lines, or lean out away from the ship's rail, in order to fasten the guards to the mooring lines and cargo hoses. This entailed considerable danger to the man and resulted in frequent loss of guards. Our company has standardized on the Mead rat guard, which eliminates the necessity for climbing out on mooring lines or leaning beyond the side of the ship. The guard is self-adjusting, readily placed over line or hose, and just as readily removed. It is also possible to attach a line to the guard and secure it to some object on deck before the guard is placed in position. This avoids dropping the guard overboard.

The precautions already outlined give some idea as to the extent to which our company has gone in making its ships safe.

Fire Prevention by Flue Gas

Our latest and incidentally one of our costliest attempts to assure complete protection is the development of what may be termed the "Flue gas system of preventing fires and explosions aboard tankers." This system was developed for the purpose of materially reducing the fire and explosion hazard incidental to operating tankers. The highly inflammable cargoes carried and the constant presence of explosive gases arising from these cargoes require unceasing vigilance. Hot rivets, welding torches, sparks from nearby smoke stacks, passing locomotives, careless smokers, lightning, static electricity created by the flow of oil into or out of ships' cargo systems are but a few of the dangers to be guarded against.

As you know, combustion or explosion is primarily dependent upon securing the proper combination of oxygen with other chemical constituents. The atmosphere surrounding a ship's cargo tanks contains about 21 per cent of oxygen. This oxygen mixes with petroleum vapors and results in a gas which needs only a spark to start a fire or cause an explosion. Chemical research has developed that if the oxygen content of the gas above the liquid cargo can be reduced to less than 12 percent, it will be impossible for combustion to occur, because there will not be sufficient oxygen present to support it. The problem then is to displace the atmosphere, with its 21 percent oxygen content, with a substitute gas, whose oxygen content is less than 12 percent.

In the case of steamships, such a gas is available in sufficiently large quantities in the gases issuing from smoke stacks. These gases have an oxygen content of not exceeding 8 percent. As they come from the boiler fires, however, they are hot, contain considerable soot, and frequently carry live sparks. Those objectionable features are eliminated by diverting them through a gas cooler, which consists essentially of a cylindrical tank 4 feet in diameter and 6 feet high. In the bottom is a partition which is submerged in about 6 inches of water. The hot gas coming from the boilers passes through this device and is forced to bubble up through the water. This puts out any sparks and removes a considerable part of the soot. In the top of the cooler is a ring of nozzles which spray salt water on to the rising gases. This continues to cool them, removes soot, and puts out any sparks that may still exist. The gas then passes through a separator for the purpose of removing any water which may have become mechanically entrained during its cooling process. The concentration of oxygen in the vapor space should never exceed 12 percent. This makes it necessary to prevent air from entering the tank.

The successful loading and unloading of a ship requires that the tanks be open to the atmosphere for such purposes as taking samples, etc., thereby providing opportunity for leakage. This difficulty is evaded by making the pressure in the cargo tank vapor space greater than the pressure of the atmosphere, so that the boiler gas leaks outward and prevents the air from leaking inward. This pressure difference is maintained by a 5-stage centrifugal blower arranged so that its suction connects to the discharge side of the cooler. The blower discharges into the tank vapor space via a long duct running the length of the ship with small separate connections into each hatch.

In order that the tanks may be opened as infrequently as possible, automatic gauges have been provided in order to continually indicate the distance from the surface of the oil to the tank top, and, inconsistent as it may seem, the design of a successful and practical gauge was the most difficult step in this entire lay-out.

The control in the fire room so that the stack gases shall have a minimum of oxygen and consequently a maximum of carbon dioxide is aided materially by the presence of a recording and indicating carbon dioxide meter.

The experimental installation was made on the steamer H. M. Storey of this company proved the success of this system in its fundamentals. During the entire testing period, at no time did the tanks become explosive, and it is believed that this condition can be maintained without placing undue requirements on the ship's personnel.

Standard Rules for Tankers

Representatives of the various oil companies have held several meetings, the object of which was to draft standardized rules for the safe loading, transportation, and discharging of bulk oil cargoes, as well as safety regulations to be observed at terminals. Many of these rules which are now in effect pertain to fire and personal safety. For example, hatch covers and ullage plugs must be kept closed on all cargo tanks while vessels are being assisted by towboats, so that danger of fire which might be started by sparks from the towboat's stack will be reduced. The loading of inflammable products is stopped whenever it is necessary to moor another vessel to the same wharf until the second vessel is safely alongside before loading or discharging operations are started.

A joint inspection of ship and wharf equipment covered by safety regulations is made by the terminal representative and ship's officer in charge. No movement of oil is permitted until all regulations are complied with.

If cargo hoses are supported by ship's tackle, the fall must be made fast to some stationary object, such as a cleat or bitt. This procedure has been found necessary for the reason that in the past falls have been made fast to gypsies at the end of the warping winch shafts. If for any reason the winch should start operating, the cargo hose would part and result in a spill of highly inflammable oil.

Repair Hazards

Shipyard repairs to oil tankers are very hazardous, unless precautionary measures are taken. You not infrequently read of disastrous explosions on tank ships while undergoing repairs. This subject has been given very serious consideration and in our company has led to the adoption of the following rules governing repairs:

Repairs at Shipyards: No repair work, requiring use of fire or spark producing tools shall be done upon a vessel at a shipyard until a gas-free certificate shall have been obtained from a certified chemist covering all tanks and compartments subject to gas accumulation.

Repairs not at shipyards, requiring fire or spark producing equipment: In no case shall any repairs, requiring use of fire or spark producing tools or equipment be made in tanks, pump rooms, or upon pumps, cargo lines, heater coils or smothering lines, or in any spaces subject to gas accumulation, until such tanks and such spaces shall have been freed of dangerous or explosive gases and sediment, nor shall any repair work be permitted on deck until ship's tanks have been certified as gas-free. Before commencing such repairs a certificate shall be obtained from a certified chemist, stating that all such tanks and spaces are free from gas. A competent inspector shall police the vessel under repairs to enforce these rules.

Repairs not requiring fire or spark producing equipment: Where repairs are necessary in and/or around cargo tanks or spaces subject to gas accumulation which will not require the use of fire, the compartment in question shall be thoroughly cleaned, free from all gases and sediment, and certified as gas-free before proceeding with any such repairs.

While these rules permit of some leeway under certain conditions, the Standard Oil Company of California has adopted a policy of absolutely gas-freeing a vessel in all compartments when undergoing repairs or drydocking. In addition to requiring the shipyard to have a certified chemist pass on the condition of the compartments, their own company chemist must certify that compartments are free of explosive gases before any shipyard employee will be permitted to carry on any work.

In our opinion, the marine departments of the large oil companies are thoroughly alive to the necessity for doing everything possible to make transportation of petroleum products by water entirely safe. The very nature of the commodity handled demands that vessel and shore personnel exercise the utmost care. While much has been done already to eliminate the hazards of the industry, we think that much can yet be accomplished by careful study and research. We believe this work will continue until our avoidable accidents are reduced to an absolute minimum.

Just as a suggestion, and in conclusion. I would like to submit this thought: If the oil companies can originate and adopt a set of safety rules pertaining to oil tankers, is it not possible for the general cargo steamship owners and the lumber schooner owners to get together and frame a set of safety rules covering their own individual transportation and ship problems? I feel such a move would show beneficial results.

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Who's Who afloat and ashore

Edited by Jerry Scanlon

Faithful services with the International Mercantile Marine Company extending over a period of more than twenty years has resulted in Chief Engineer Ernest F. Prince being awarded the appointment as master of the mechanical propulsion of the new liner California of the Panama-Pacific fleet.

Chief Engineer Prince, who served for years as chief aboard the liner Mongolia, is now familiarizing himself with the physical operation of the California, which is nearing completion in the plant of the Newport News Shipbuilding & Drydock Company on the James River, Virginia.

Fellow shipmates of Prince aboard the Mongolia presented the popular chief engineer with a beautiful writing set before he left the Mongolia. Chief Engineer Prince will remain shoreside and stand-by the California until the palatial new liner is ready to enter the New York-California service next January.

The California, the largest vessel thus far to be laid down in an American shipyard, is to be launched next month, according to Leo Archer, Pacific Coast manager of the Panama-Pacific Line. In command of the California will be Captain H. A. T. Candy, master of the Mongolia, senior officer of the company.

Judging from the stories that Captain L. H. Westdahl, assistant marine superintendent of the Dollar Line, has been telling along California street and the waterfront, the trout fraternity of the Feather River were darned glad when the "Generalissimo" of the Dollar operating department folded his tent, packed his fishing gear, and departed for home.

A huge deficit faces the Fish and Game Commission of California and the rank and file of the trout families that haunt the rivers and streams of the state have been sadly depleted, one surmises after hearing the reports of the marine anglers that covers expeditions to all parts of California during the past three months.

Among those of the Izaak Walton League who showed no quarter to the fin tribe were George Armes, president of the General Engineering and Drydock Company, and Frank Fox of the same organization. Both reported catches only equalled by the stories told by William C. Empey, publisher of the "Guide"; Joseph Moore, president of the Moore Dry Dock Company; Louis Siverson, sales manager of the Bethlehem Shipbuilding Corporation; John T. Greany of the Bethlehem Shipbuilding Corporation; and Frank O'Connor of the Donovan Lumber Company.

Chief Engineer E. F. Prince.

Any of the above named sportsmen will be only too glad to tell of their prowess with rod and reel to all who may be interested in learning the piscatorial art.

Harry Bach, formerly on the Panama Mail liner Colombia, has been assigned as second officer aboard the steamer Venezuela. George Dow, second officer of the steamer Colombia, has returned to his vessel, after a two months' vacation.

After two months' leave, following the death of his mother, William A. McLean, one of the best known pursers sailing the Pacific, has returned to sea on his old berth, the liner Venezuela.

While this story is a little late, never-the-less it concerns Jack Presser, one of the best known chief stewards on the Pacific and is being told for the first time in print.

Presser served as chief of the cuisine department aboard the Admiral Line greyhound H. F. Alexander when the crack liner was operating last year between New York and Miami. The vessel was the transportation medium for some of the best known men and women in the business and social life of America.

On one trip, Chief Presser was host to Mayor James Walker of New York, who presented the genial chief with a guest card to the Lambs Club.

One day while the H. F. Alexander was in New York, Chief Presser decided to gambol with the members of the Lambs Club. At the registration desk, the clerk listed Chief Presser as follows: "Admiral John J. Presser, U. S. N. R., San Francisco." The mistake was due to the fact that Chief Presser made the statement that he was with the Admiral Line.

Word spread among the members that Admiral Presser of San Francisco was a guest of the Lambs. Unknown to Presser, a dinner in honor of the visiting "Admiral" was arranged, and the fete was attended by the leading lights of Broadway with a goodly number of admirals, captains and lieutenant-commanders of the Navy present.

Mayor Walker is reported to have been the instigator of the dinner, and only a few were aware of the fact that Chief Presser was not an admiral. Presser stated that he was busy all evening saluting admirals and returning salutes to captains, commanders, lieutenant-commanders and lesser lights of Uncle Sam's Naval men. Chief Presser is now in charge of the cuisine department on the Emma Alexander.

Captain Morgan Walcott is in charge of the new Seamen's Church Institute nautical school at San Pedro. The school is devoted to preparing American youth for the merchant marine service. Captain Wolcott is widely known in Pacific ocean shipping circles. Thirty-five years ago, Captain Wolcott was an officer abroad vessels of the old Pacific Mail Company. He was a naval ensign during the Spanish-American War. He was also at one time master of the old United States Army transport Crook.

Howard E. Wollaston will resume his berth as second officer on the Dollar liner President Lincoln early this month after a two months' vacation. This is Wollaston's first vacation in six years, and he spent his shoreside lay-off visiting various parts of California.

The Dollar liner President Harrison of the around-the-world fleet was the first vessel to berth at the company's new pier on the Hudson river. This

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terminal is located at the foot of Twelfth street, Jersey City, directly at the entrance of the new vehicular tubes linking Manhattan with New Jersey.

The pier is a double-decked, fireproof structure of steel and concrete, 1247 feet long and 150 feet wide.

Christian Olsen, for more than twenty years connected with the I. M. M., has been appointed chief engineer on the intercoastal liner Mongolia. He succeeds Chief Engineer Ernest F. Prince, who has been assigned as chief of the new liner California.

George V. Richardson is now in command of the steamer Manchuria. He is relieving Captain William J. Munro, who is on vacation. Richardson has been staff officer on the Manchuria for many years, and it is reported that he will be appointed master of one of the Panama-Pacific Line vessels.

There will be a captaincy open following the elevation of Captain H. A. T. Candy to command the California. He was formerly skipper on the Mongolia.

Captain D. F. A. De Oppe has assumed his position as head of the U. S. Coast Guard Service, with headquarters in San Francisco. His jurisdiction extends from Cape Blanco, Oregon, to the Mexican border.

An intensive survey of Pacific Coast terminals and general shipping facilities was made during the last month by E. R. Innis, superintendent for the Donaldson and Cunard Lines at New York. During the visit of Mr. Innis he was feted by Pacific Coast marine leaders. While in San Francisco Mr. Innis was the guest of J. C. Fogarty, assistant Pacific Coast manager of the company.

Robert C. Thackara, one of the best-known steamship men in America, has assumed his position as manager of the newly created United States Intercoastal Conference. The position, one of the most important ever invested in an American steamship official, was accepted by Mr. Thackara following months of solicitation upon the part of leaders in this trade.

Mr. Thackara is as well known in Pacific Coast maritime affairs as he is on the Atlantic. Seventeen years ago he was Pacific Coast manager of the Luckenbach Lines. For the past five years he was vice-president of the Luckenbach interests with headquarters in New York. Roger D. Lapham, president of the American-Hawaiian Steamship Company, who is prominently identified with the Intercoastal body, said:

"The choice of Mr. Thackara as head of the United States Intercoastal Conference is a happy one. This efficient steamship man has the confidence of the shipper and the operator alike, and we are all confident he will make good."

Chief Christian Olsen.

The Pacific Coast committee formed recently to represent the American Bureau of Shipping is composed of San Francisco shipbuilding and steamship executives whose names are familiar to the maritime world.

The committee is composed of J. J. Tynan, vice-president and general manager, Union Plant, Bethlehem Shipbuilding Corp.; John C. Rohlfs, manager of the marine department of the Standard Oil Company of California; R. Stanley Dollar, vice-president of the Dollar Steamship Company; A. C. Dierícx, vice-president and manager of the Matson Navigation Company; F. W. Hibbs of Hibbs, McCauley & Smith, marine architects and surveyors; Joseph A. Moore, president of the Moore Dry Dock Company; and Captain A. F. Pillsbury of Pillsbury & Curtis, marine architects and surveyors.

Hugh Gallagher and E. C. Brown.

John Dal Pais, head of the French Line, whose company boasts some of the finest trans-Atlantic liners, is expected to make an extended investigation of Pacific Coast shipping conditions the middle of October. This will be the first visit of the widely known president of the Compagnie Generale Transatlantique to the Pacific Coast, and his trip here is to gain a first hand impression of Pacific Coast ports.

A Frigidaire plant installed in the Panama Mail liner Venezuela's dining salon has made such a fine contribution to the cuisine department that Captain Ryland Drennan, superintendent, announces that the other two San Francisco- New York vessels, the Colombia and Ecuador, are to be similiarly equipped. The Frigidaire system is used to equalize the temperature for all fresh fruit dishes in all climates and has met with high favor from the steward's department, according to Captain Drennan.

A deficit of $1,483,138 in operations was the report of the International Mercantile Marine for the year 1926, according to their report in pamphlet form issued to stockholders. The amount charged to depreciation of the company's fleet is $5,040,415, representing a reduction of $600,000 from the total of the report of the previous year.

On his first visit to the Pacific Coast and surprised at the maritime activities of ports along the Pacific Coast and tributary waters, Sir Percy Bates, deputy chairman of the board of directors of the Cunard Line, left for his headquarters in Liverpool after an extended visit.

Sir Percy stated that a half a century ago his father had a fleet of clipper ships plying from England via the Horn to Pacific Coast ports and that he, himself, had a number of smart sailing ships engaged in the same trade until he joined the Cunard interests. The distinguished British maritime executive made a tour of all the leading ports of the United States during his visit to America.

Leo De Leeuw of the passenger department of the French Line offices in San Francisco is far from the cooling breezes of the Pacific Ocean. He is on a tour of Northern Africa, and a message to his offices reports the temperature decidedly warm.

E. D. Tenney, chairman of the Board of Directors of the Matson Navigation Company, with his family is spending several months in San Francisco. Mr. Tenney and his family plan to remain in this city until after Christmas.

Harry A. Barnett, well known to the shipping world, has been selected as

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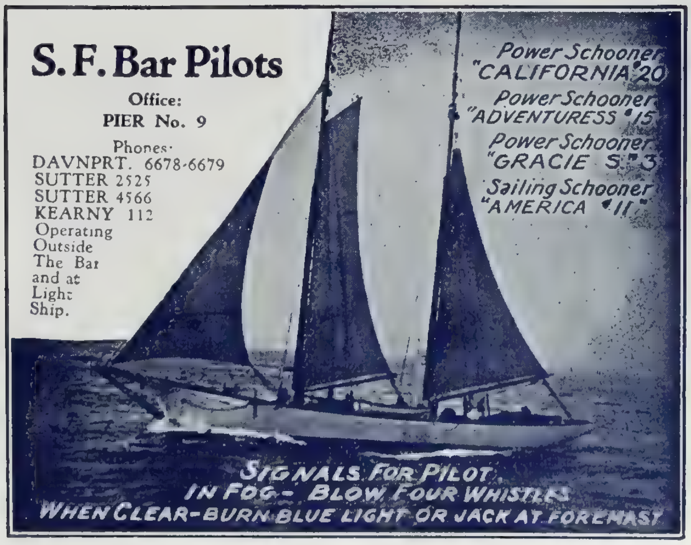

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marine surveyor at Victoria, British Columbia, for the Board of Marine Underwriters of San Francisco.

Ill health has caused Percy Griffin to resign as secretary to William P. Roth, president of the Matson Navigation Company. He was succeeded by Sydney G. Walton.

On vacation, or holiday, as they say in the Far East, William R. Walters, city passenger agent in Shanghai for the Dollar Line, is a visitor to the Pacific Coast. He plans to remain here for three months before returning to his post.

The Puget Sound district office of the Bayside Steamship Company and the Bayside Lumber Company, is now in charge of L. A. Malarin, who was formerly located in San Francisco. Mr. Malarin was at one time western sales manager for the Radio Corporation of America.

The recent announcement from New York to the effect that Lewis Luckenbach had been appointed to succeed Robert C. Thackera, resigned, as vice-president of the Luckenbach Steamship Company, came as no surprise to his many friends on the Pacific Coast.

Son of Edgar F. Luckenbach, president of the Company, Lewis Luckenbach has won his way upwards in the firm by dint of application and merit. He started at the bottom of the ladder checking freight and rose step by step to the position that he now holds—right hand man to his father and second in command of the Luckenbach Steamship Company.

Winfield N. Thompson, advertising and publicity director for the International Mercantile Marine, has about succumbed to the lure of California. This active executive, who for more than fifteen years has held one of the key positions with the I. M. M., is now in the West, and he intimated that he believes that he is going to make this his home.

Mr. Thompson will still retain his affiliations with the company, but his New York office activities will be undertaken by one of his subordinates, according to current reports. P. A. S. Franklin, head of the I. M. M., is reluctant to have Mr. Thompson desert the New York offices, according to advices received by the writer from the East.

World travel conditions are healthy, was the word brought back by James King Steele, general advertising agent of the Nippon Yusen Kaisha, who has just completed a circle tour of the World.

Chairman O'Connor of the Shipping Board, in company with Commissioners Teller and Myers, has scheduled for early October a trip to the Pacific Coast in connection with the sale of Pacific Coast operated government tonnage, and the report prevails that President Dalton will also be in the party.

Ned Lorenzen and "Chip."

The sea breeds loyalty among animals as well as men. Take the case of "Chip" owned by Purser Ned Lorenzen of the Panama Mail liner Ecuador and mascot of the ship. When the Ecuador sailed eastbound from Corinto, "Chip" was not aboard. The Ecuador proceeded on her way to New York. When the vessel returned to Corinto, a month later, there was "Chip" gamboling and barking on the pier awaiting the vessel and his master.

Robert D. Pickett who has resigned as travelling passenger agent of the International Mercantile Marine Company in San Francisco, has announced his intention to leave for Sydney, Australia, August 25 to enter the tourist agency business. He was formerly connected with the Dollar Line transpacific service as purser. He has also held the same position with the old Pacific Mail Steamship Company.

William N. Swasey, veteran immigration boarding inspector at Meiggs Wharf, San Francisco, has ceased taking a pay check from the government and has caused considerable regret among old friends in that vicinity who hate to see him leave.

A year ago, an order came from Washington announcing that in the future all immigration men would change from the customary modest blue uniform to one of brown whipcord resplendent with several pounds of gold braid, and all the fixin's, including cap and puttees.

Swasey showed his disapproval of this handsome sheiky outfit by asking to be transferred to some other department with a larger choice of clothing. This was granted. Lately he announced his resignation from the service. He will enter private practice with offices at 617 Montgomery street, San Francisco.

The Bureau of Foreign and Domestic Commerce, San Francisco Customs House, will lose the services of Leonard B. Gary, for the past four years district manager of that department. He has resigned his position to become manager of the southern district of the California Development Association at Los Angeles.

Wesley O. Ash took Gary's place as San Francisco manager for the Bureau of Commerce commencing August 15.

Frederick Sturgess, publicity manager of the McCormick Steamship Company for the past two years, has resigned and will join as partner in an advertising agency to be established in San Francisco in the near future.

Harry Wills, Los Angeles manager of Thomas Cook & Son has announced his intention of taking a trip to Europe for an extended vacation. He was tendered a farewell dinner by friends and associates. Among San Franciscans attending were: M. H. Hunt, general agent of the United States Lines, and Charles Stokes, Pacific Coast manager of Thomas Cook & Son.

Engineer staff of S.S. Manchuria.

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This yacht-like liner will be the latest addition to a famous fleet devoted to the service of Hawaii, the islands of the South Seas, and Australia. Haven't you ever longed to face the setting sun on one of these ships bound for romance?—**Malolo, Maui, Matsonia, Manoa, Wilhelmina, Lurline, Sierra, Sonoma, Ventura.**

Go now. All your favorite sports await you in a delightfully new environment. The cost is low—21-day all-expense tours from $270.

One or more sailings every week from San Francisco. The MALOLO will sail every second Saturday. Also regular sailings from Seattle.

Write our nearest office as shown below or ask any tourist agency for literature and complete particulars.

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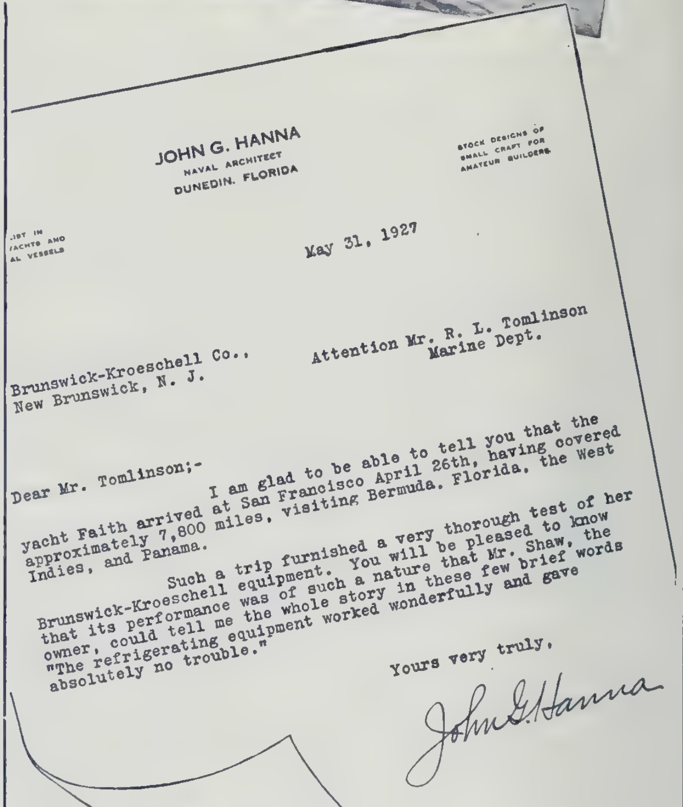

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May 31, 1927

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Attention Mr. R. L. Tomlinson
Marine Dept.

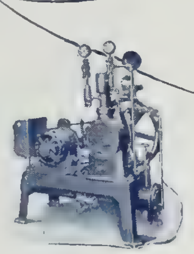
Dear Mr. Tomlinson;-

I am glad to be able to tell you that the yacht Faith arrived at San Francisco April 26th, having covered approximately 7,800 miles, visiting Bermuda, Florida, the West Indies, and Panama.

Such a trip furnished a very thorough test of her Brunswick-Kroeschell equipment. You will be pleased to know that its performance was of such a nature that Mr. Shaw, the owner, could tell me the whole story in these few brief words "The refrigerating equipment worked wonderfully and gave absolutely no trouble."

Yours very truly,

John G. Hanna



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BRANCHES, AGENCIES AND SERVICE IN PRINCIPAL CITIES

The Port of Alexandria

(Continued from Page 417)

winch method. There is no law to enforce the use of the cranes and they, therefore, serve as an ornament to this splendid modern pier. This opposition to the use of cranes is found at many newer ports for years accustomed to using ship's winches only.

The coal quay, Quay a Charbons, has a small spur quay pier for general merchandise, otherwise the entire pier is equipped with coal bridges for the rapid handling of the fuel to and from the stock pile.

In the inner harbor along all of these quays used for general merchandise the unusual system of breasting the vessel off from the pier by means of wide stout wooden lighters or pontoons is striking. All passengers and merchandise are landed from the ship onto these pontoons and are run ashore from there.

There are the following port structures in the outer harbor: (1) The first equipment to the southwest of the Quay a Charbons is the Quay des Inflamables, a petroleum products harbor section with five small piers and a tank farm.

(2) The great lumber terminal quay, Quay a Bois, near the entrance to the outer port. This terminal consists of three wide quay-piers and an upland of huge hangars almost resembling a shipyard, equipped with the most modern lifting and transporting machinery. At the present time the most of this elaborate modern equipment lies idle because the owner was so successful in his lumber operations during the war that he has retired from business and written off the investment in this equipment.

Westward from the Quay a Bois are the (3) Quay a Nitrates, and (4) the Quay de la Quarantaine.

The entire port literal of Alexandria is enclosed by a high wall and stockade carefully guarded by harbor police as in a free port. These harbor police deserve special mention. They are largely native Egyptian, that is, Arab stock, with some English officers. They are immaculate in the appearance of their perfectly fitting uniforms and most soldierly and snappy in their bearing. The Department of Ports and Lighthouses of Egypt is under Captain Philip Streatfield Pasha, Royal Navy, with a staff also largely native Egyptian. The entire appearance of the well kept port, its snappy police, and its modern construction is in conformity with the modern spirit of progress abroad in Egypt—a spirit that carries with it a danger that the Egyptians may become so nationally self-conscious that they stub their toe on the British protection of the Suez Canal stone. However, Captain Streatfield's staff is also the high office in the Ministry of Communications of Cairo, and are enterprising and progressive young Egyptians alert and ambitious. In fact, the Quay Mahmoudieh was designed by Samy Pasha, an engineer, at present Egyptian Minister in Washington, while Under Secretary of Public Works.

Nile boatmen on the Mahmoudieh Canal.

Sixty Years of Steamboating

(Continued from Page 419)

Here then we have an interesting comparison between the propelling equipment of two great, shallow draft, paddle wheel steamers, one driven by large diameter, simple steam engines and crude return tubular boilers containing excessive weights of water, the other employing compound engines and very efficient water-tube steam generators, superheated steam, and highly heated feed water.

In some quarters it is carelessly stated that "river steamboating" has not progressed and that during the two generations since the Robert E. Lee was the finest of her kind nothing better has been produced. No doubt it is true that speed has not been increased, that more extravagantly equipped vessels are not practicable, but there can be no doubt in the mind of any thinking man that tremendous advances have been made. A steamer such as the Robert E. Lee under present day conditions and prices could not maintain herself in profitable trade on the rivers. The unthinkable waste of fuel that was given little consideration in those days has been supplemented by a perfection of operation, a reduction in cost of repairs, and a saving in weight of steam generating equipment that makes it possible for modern river type transportation to compete with the railroads.

Successful Motorship Trial

THE motorship City of Dalhart, recently converted from a steamship under the Shipping Board diesel conversion program, passed a successful trial trip off the Virginia Capes July 26. The vessel maintained an average speed of 13.35 knots an hour during her six-hour speed test, and tests of her equipment showed her to be ready for immediate service.

Following her trial the ship left Newport News for New York where she loaded cargo destined for Australia. She is being operated on the Atlantic-Australia Line by the Roosevelt Steamship Company.

The ship was converted from an oil-burning steamer of 10 knots to a motorship of the speed recorded above. She is equipped with a Busch-Sulzer 2-cycle, single-acting engine of 3000 brake horsepower and with Worthington auxiliary diesel engines. The main engine has six cylinders each 30 inches in diameter and the piston has a stroke of 52 inches. The speed of the engine is 90 revolutions per minute at full power.

The length of the ship is 416 feet. She is strictly a cargo ship but in connection with installing the diesel equipment accommodations for 15 passengers in well ventilated rooms, having metal beds, electric fans, and running fresh water, have been provided. The total cost of conversion was $829,750.

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IT will pay you in time and money to **ship to the ports nearest to America**—those served by the Great Western Railway, because

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The Great Western Railway operates 1,200 freight trains daily and 5,000 road trucks. In addition to the saving in time and money by storing in Great Western Railway warehouses, American exporters are assured of next day deliveries in Liverpool, London, Birmingham, Manchester, etc., etc.

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The round trip from Los Angeles can be made for $278.50 and up—according to steamship and hotel accommodations selected—covering every expense ashore and afloat.

SEPTEMBER SAILINGS

S.S. CALAWAII	Sept. 3
S.S .CITY OF LOS ANGELES	Sept. 10
S.S. CITY OF HONOLULU	Sept. 24

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Los Angeles Steamship Co.

For Passenger Information Address:
730 So. Broadway, Los Angeles.
685 Market St.. San Francisco.
For Freight Information Address:
408 Central Bldg., Los Angeles
Pier 7 - - San Francisco

Freights, Charters, Sales

August 17, 1927.

THE following steamers are reported fixed with grain from the North Pacific to the United Kingdom Continent: British stmr. Salmonpool, 32/6, option barley from San Francisco, 33/9, Aug./Sept.; British stmr. Ornus, San Francisco, 33/9, Sept./Oct.; British stmr. Briarwood, 34/3, option Vancouver, 33/-, Oct./Nov., Wilmer Grain Co.; British stmr. Linkmoor, 33/-, Sept., Wilmer Grain Co.; British stmr. Rudby, 35/-, Aug./Sept., Kerr, Gifford & Co.; British stmr. Benalder, Sept., Balfour Guthrie & Co.; British stmr. Demeterton, 30/-, Sept., Strauss & Co.; British stmr. Falls City, Sept., Balfour, Guthrie & Co.; British stmr. Anglo Peruvian, Sept., Continental Grain Co.; British stmr. King Alfred, 31/-, Sept., Dreyfus & Co.; British stmr. Bengloe, Oct., Balfour, Guthrie & Co.; British stmr. Kinross, 32/3; British stmr. Swainby, 35/-, Sept., Kerr, Gifford & Co.; British stmr. Trelevan, 32/-; British stmr. Ventura de Larrinaga, 31/-, Oct., Kerr, Gifford & Co.; British stmr. Barrdale, 32/, Sept./Oct.; British stmr. Taransav, 31/3, Sept.; Italian stmr. Ansaldo Savoia Secondo, 33/-, Sept., Strauss & Co.; British stmr. Fernmoor, 32/6, Aug./Sept., Kerr, Gifford & Co.; British stmr. Anglo Egyptian, 32/-, Sept., Strauss & Co.; British stmr. Baron, 32/3, Oct./Nov., Strauss & Co.; British stmr. Ethel Radcliffe, 32/-, Oct., Strauss & Co.; Japanese stmr., 33/6, Oct., Balfour, Guthrie & Co.; British stmr. Bradclyde, 35/-, Sept., Strauss & Co.; British stmr. Eastern City, 35/-, Sept., Strauss & Co.; British stmr. Eastmoor, 35/-, Sept., Continental Grain Co.; a steamer, 33/9, Oct., Balfour, Guthrie & Co.; a steamer, 33/-, Sept., Kerr, Gifford & Co.; a steamer, 33/-, Oct., Strauss & Co.

The British stmr. Tymeric is reported fixed with lumber from Grays Harbor to Australia, by American Trading Co. The Japanese stmr. Boston Maru is reported fixed with lumber from North Pacific to Japan, Aug., Nakagawa & Co.; and Japanese stmr. Yonan Maru, from Columbia River to Japan, Sept., by Douglas Fir E. & E. Co.

The following lumber fixtures to the Atlantic are reported: American stmr. Henry D. Whiton, $14.50, Aug., A. C. Dutton Lumber Co.; Japanese stmr. Kurohime Maru, $14.25, Sept., Canadian Transport Co.; American stmr. Maltram, Grays Harbor to New York, $15, Sept., Shepard & Morse Co.; Japanese stmr. Yoshu Maru, Oct., Canadian Transport Co.; American stmr. Catherine G. Sudden, $15.25, Aug./Sept., Brady Ketcham Lumber Co.; Norwegian stmr. Remus, Aug., Canadian Transport Co.; American stmr. Edna Christenson, $15.50, Brady Ketcham Lumber Co.; American stmr. Oneida, $14.75, Sept./Oct.

The German stmr. Karpfanger is reported fixed from the North Pacific to South Africa, Oct. loading, lumber and merchandise, J. J. Moore & Co.; American stmr. Margaret F. Sterling, Vancouver to Fiji and Tonga, lumber and merchandise, Sept., Wolff Kirchmann & Co.; British stmr. Firby, British Columbia to Yokohama & Kobe, lumber and merchandise, Aug./Sept., Canadian American Shipping Co.; British stmr. Sedgepool, British Columbia to Osaka, lumber and merchandise, Aug./Sept., Canadian American Shipping Co.

The following time charters are reported: British stmr. Fishpool, Pacific trade, delivery North Pacific, Aug., Canadian Transport Co.; Norwegian m. s. Fordefjord, delivery Kingston, July, redelivery north of Hatteras via. British Columbia, $1.30; American stmr. Willa Crosby, Puget Sound to north of Hatteras, delivery and redelivery North Pacific, prompt; Swedish m.s. Falsterbo two years continuation, $1.45, W. L. Comyn & Co.; Japanese stmr. Biyo Maru, 12 mos. Pacific trade, delivery Japan, Yen 1.90, July, Yamashita Co.; Japanese stmr. Juyo Maru, same; Japanese stmr. Choyo Maru, 12 months, Pacific trade, delivery Japan, Yen 1.95, Oct., Ocean Transport Co.; Japanese stmr. Fukuyo Maru, same, Sept.; Japanese stmr. Hayo Maru, same, Sept., Asano Busson Kisen Kaisha; Japanese stmr. Meiyo Maru, same; Japanese stmr. Reiyo Maru, same, Oct., Ocean Transport Co.; Japanese stmr. Woyo Maru, same, Yen 1.90, July, Yamashita Co.; Norwegian m. s. Brynje, 1 year Pacific trade, $1.55, Jan., 1928, American Trading Co.; Norwegian m. s. Borgestad, 1 year Pacific trade, $1.55, Jan., 1928, American Trading Co.; British stmr. Madras City, Pacific trade, 11/13 months, delivery, redelivery Yokohama, $1.15, Nov.; Norwegian m. s. Brand, North Pacific to Australia, Pacific Export Lumber Co.

The following sales are reported: American stmr. Arizonan, American-Hawaiian Steamship Co., to Compagnie Generale Armento Societa Anonina, Genoa, Italy; American stmr. Chamblee, U. S. Shipping Board to Hammond Lumber Co.; American steamer Windber, Pacific American Fisheries to Schuman Steel and Mach. Co., Bellingham (to be dismantled); American schooner Chillicothe, J. J. Moore & Co., to French Shipping Company of Sydney; American stmr. Westmead, U. S. Shipping Board to Williams Steamship Co. (to be renamed Willanglo); American stmr. Western Glen. U. S. Shipping Board to Williams Steamship Co. (to be renamed Willello).

PAGE BROTHERS, Brokers.

Nonliability Notice

THE De La Vergne Machine Company has received information that an old man, traveling under the name of Wolf, is posing as a representative of that company and borrowing small sums of money wherever he can. This man states that he is 76 years of age and that he has had a very large family, who are now all scattered, and that he is en route from Japan, where he has completed the installation of a 3000-ton De La Vergne ice machine, and is on the way to England, together with four mechanics, to start work on a steam plant. The De La Vergne Machine Company is hereby giving notice that they have no knowledge of this individual and are warning all readers of Pacific Marine Review not to advance money to anyone claiming to be a representative of the De La Vergne Machine Company.

The Duesenberg Racing Car. By T. H. Wickenden, Development and Research Department, The International Nickel Company, Inc., 67 Wall street, New York, N. Y. (four pages). A description of the winning car in the 1927 Indianapolis 500-mile automobile classic and a consideration of the engineering features of its design.

Evolution of Marine Radio

(Continued from Page 410)

paratus so the advantages of continuous-wave transmission might be enjoyed at both ends. It has been no easy matter to discard the hundreds upon hundreds of spark and other obsolete transmitters in use on ships, in favor of the new tube sets. The investment represented in the older types, together with the expense of the new equipment and the vast production called for, has tended to make the change more or less gradual. So that new installations have been of the new tube type, while some 300 existing spark transmitters have been rebuilt into the modified tube type to minimize the cost of the change-over. Engineers of the Radio Corporation of America, the General Electric Company, and the Westinghouse Electric and Manufacturing Company have shown no little ingenuity in converting existing spark sets into tube transmitters. The spark transmitter elements of the usual transmitter have been replaced in large part by the vacuum tube elements, to form an interrupted continuous-wave transmitter, comparing favorably with pure continuous wave and representing at least 100 per cent improvement in performance over the former spark transmitter.

The work of equipping and reequipping in the change from spark to vacuum tube has been going on steadily during the past two years. Already several hundred ships are equipped with vacuum tube apparatus, or will be very shortly. Spark signals are becoming a rarity, except for the occasional small foreign ship which comes into an American port and proceeds to squat on the 450-meter or 600-meter channels in unloading its traffic amid a world of broadcast entertainment, and also a few coastal stations still operating with spark transmitters.

Vacuum-tube transmission has more than justified the fondest expectations. With the vast increase in distances spanned, ships are now keeping in touch with the land stations on the transatlantic course, even beyond the half-way mark across the ocean. Atlantic coastwise ships have little difficulty in maintaining contact with Tuckerton even to the Carribbean and beyond. The static-infested Gulf of Mexico finds vacuum tube transmitters getting through hundreds of miles of space in broad daylight, with precision and certainty.

But the climax of vacuum-tube technique is to be found at the very elbow of Cape Cod, where the Chatham station stands guard over the transatlantic shipping. Here the visitor finds a brick building, alongside a large hotel and several brick dwellings to accommodate the station crew. Upon entering the building, the visitor is confronted with the busiest scene imaginable, both to the eye and to the ear. There are rows upon rows of operating tables, some for the radio circuits that extend out to ships at sea, and others for the telegraph lines stretching to the distant main traffic office in New York City and to the traffic office in Boston. And the scene is most suggestive of a busy telephone central. The operators are seated before tables with high backs containing the receivers—13-tube super-heterodyne sets, working on the Beverage wave antenna some mile and a half long! A supervisor, listening in to all incoming traffic, assigns each operator to a given ship, whereupon the operator tunes in and receives the traffic, pounding away the radiograms on his typewriter just as fast as the distant ship operator can "shoot" them in. When the Chatham operator's turn comes to "talk," he does so through the longwave transmitter, of which there are two, at Marion, 55 miles away via remote control wires, or through one of the short-wave marine transmitters in a nearby building. A flip of a switch on the operating table throws in the desired transmitter just when it is needed, provided colored lights do not flash on the table to inform the operator that the facilities are being used by another operator. And just as fast as the radiograms are received at Chatham, from ships at sea, they are copied on the perforator keyboard so that the perforated paper tape may be whizzed through the automatic transmitter which speeds the radiograms over the telegraph line to New York or Boston. Meanwhile, an avalanche of traffic in the opposite direction is bringing radiograms into Chatham for ships scattered near and far.

That, in brief, is a picture of marine radio today. Surely the oldest branch of radio communication has kept up with the rapid march of radio progress and has made every effort to keep off the toes of its companion, radio broadcasting.

Soft Soap and Hard Law

(Continued from Page 409)

had finished with him, the United States Department of Justice could take a hand by indicting him and all concerned criminally under the Sherman Act for conspiracy to restrain trade and also by filing a bill in equity requesting an order to dissolve the merger and compel the return of the stock, assets and plant of the Greaso Company. Old man Barker's jaw dropped and he told Joe to go ahead and settle on the best terms he could with the Commission.

Later on an article appeared in the press to the effect that the case of Federal Trade Commission versus Barker and Company, Inc., et al, had been compromised on an agreed statement of facts and that an order had been entered compelling that company to divest itself of the stock of the Slippo Company and furthermore not to use its ownership of such stock in such a way as to acquire the plant and assets or other properties of that company, and moreover, that the order of the Commission to Barker and Company, Inc., to divest itself of the stock, plant, and assets of the Greaso Company had been dismissed.

Old man Barker was a sadder and a wiser man. His house of cards had fallen over his ears. In an endeavor to ascertain what he could and not do he sat reading a copy of the Sherman and Clayton Acts furnished to him by his attorney. After an hour's attempt to assimilate and digest the meaning of many phrases such as, "it shall be unlawful," "substantially lessen competition," "provided that," and "provided further that," he threw the pamphlets aside and ran for his secretary and said, "Call up that damned lawyer and tell him that he is retained by the year! Safety first hereafter! Soft soap cannot change hard law!"

Pacific Marine Review

The National Magazine of Shipping

October, 1927

How the Shipper has been protected on the new *"Dixie"*

TO ASSURE his goodwill and continued patronage, the shipper has been carefully protected on the new "Dixie." He has been protected from the inconvenience of damage to his shipments and of delay in their delivery caused, so often, by fire.

On the "Dixie," the Rich-Lux System protects the shipper from cargo fires. It removes their seriousness by efficiently detecting and extinguishing them at their onset.

Within two minutes of the first trace of smoke, this system detects fire and definitely locates it. It then promptly extinguishes it with a minimum of fire damage and without harming or wetting the remaining cargo.

Such efficient protection of the shipper's interests is of importance on your cargo ships too. With this system on guard the very necessary goodwill of your shippers is made safe from inroads by fire.

Walter Kidde & Company, Inc.
140 Cedar Street
New York

THE LUX-RICH SYSTEM

handles cargo fires efficiently

LUX The RICH System

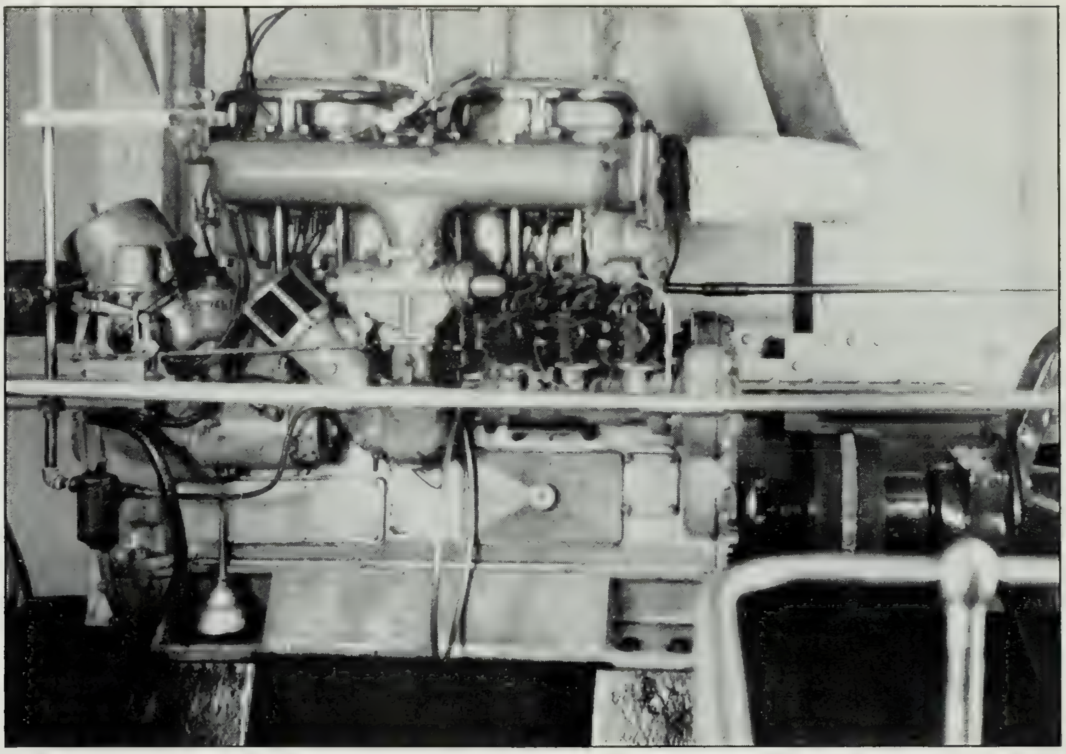
Official Organ
PACIFIC AMERICAN

Official Organ
SHIPOWNERS' ASSOCIATION

Pacific Marine Review, Vol. 24, No. 10. Published Monthly in San Francisco. Entered as second class matter at the post office at San Francisco under the act of March 3, 1879. $2.00 a year.

Sterling
THE ENGINE OF REFINEMENT

Auxiliary Generating Sets For Marine Service



One of the 60 k.w. direct current emergency generating sets furnished the Southern Pacific Company and the Northwestern Pacific Railroad Company on their new diesel-electric ferry boats.

Reliability · Compactness · Low First Cost

These three essentials of marine auxiliary units are found in Sterling driven generating sets. Coupled with these advantages are the low maintenance and operating costs that have led the majority of naval architects and engineers to specify "Sterling or equal approved" for this type of service.

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Pacific Coast Representatives:

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401 Bradbury Building
LOS ANGELES

Pacific Marine Review

CONTENTS

October, 1927

Frontispiece ... 11
Editorials ... 445
    Pacific Foreign Trade Council; The California; Portland Radio River Reports, by O. N. Barnhill; Hydrographic Survey of Panama Bay, by C. H. Calhoun; Shipping in Europe, by A. C. Holzapfel; Converted Tanker Makes Good.
The Future of Aviation, by J. Frederick Richardson ... 448
Load Line Legislation, by Clergue C. Schilling ... 450
Radio—Past, Present and Future, by G. Harold Porter ... 451
A Voyage to Australia in an Emigrant Sailing Ship Forty Years Ago, by James W. Casey, Seaman ... 453
The High-Speed Oil Engine, by H. F. Shepherd ... 455
    Some notes on design, research, and shop practice.
Havana Once More a Passenger Liner, by H. M. Wick ... 457
    Ward Line rebuilding old favorite at cost of million at Todd Dry Docks, Inc., Seattle.
Colonial Beacon ... 459
    Sun Shipbuilding Company delivers fine shallow-draft tanker to Beacon Oil Company of Boston.
Latest Diesel-Electric Ferries ... 460
Hawaii, The Yachtsman's Paradise, by Jean F. Hobbs ... 462
In the Engine Room:
    Practical Chats with the Engineer ... 464
    Some A.B.C.'s on Electric Motors ... 465
    Liner Wear on Diesel Engines ... 466
Pacific Workboats and Their Power Plants:
    British Columbia Workboats ... 468
    Workboats at New Westminster ... 470
    A Tugboat with a Past ... 472
    Worthington Engines for Workboats ... 473
Charles T. Fisher's New Winton-Powered Cruiser Saramar II. ... 472
Auxiliaries, Ship Supplies, Marine Equipment:
    Two New and Valuable Aids to Navigation ... 474
    When to Discard Wire Rope ... 475
    New Yale High-Lift Truck ... 476
    Rix Auxiliary Booster ... 477
    New Time-Delay Push-Button Station Keeps Motors Running ... 477
    Lipman Service ... 477
    New Westinghouse Portable Standard Watt-Hour Meter ... 478
    Ship Crane Test ... 478
    Motor Smaller than Postage Stamp ... 478
Marine Insurance ... 479
American Shipbuilding ... 485
Trade, Shipping, Personals:
    Trade Winds ... 15 Advertising Section
    The Calmar Line ... 18 Advertising Section
    Who's Who Afloat and Ashore ... 19 Advertising Section
    Beaumont's New Port Director ... 25 Advertising Section
    Port Notes ... 27 Advertising Section
    Freights, Charters, Sales ... 29 Advertising Section
Growth of the Williams Line ... 484
Of a General Nature:
    A General-Electric Melon ... 477
    The Willamette Institution ... 478
    Trade Literature ... 483
    Barge Erection at Balboa ... 30 Adv. Section

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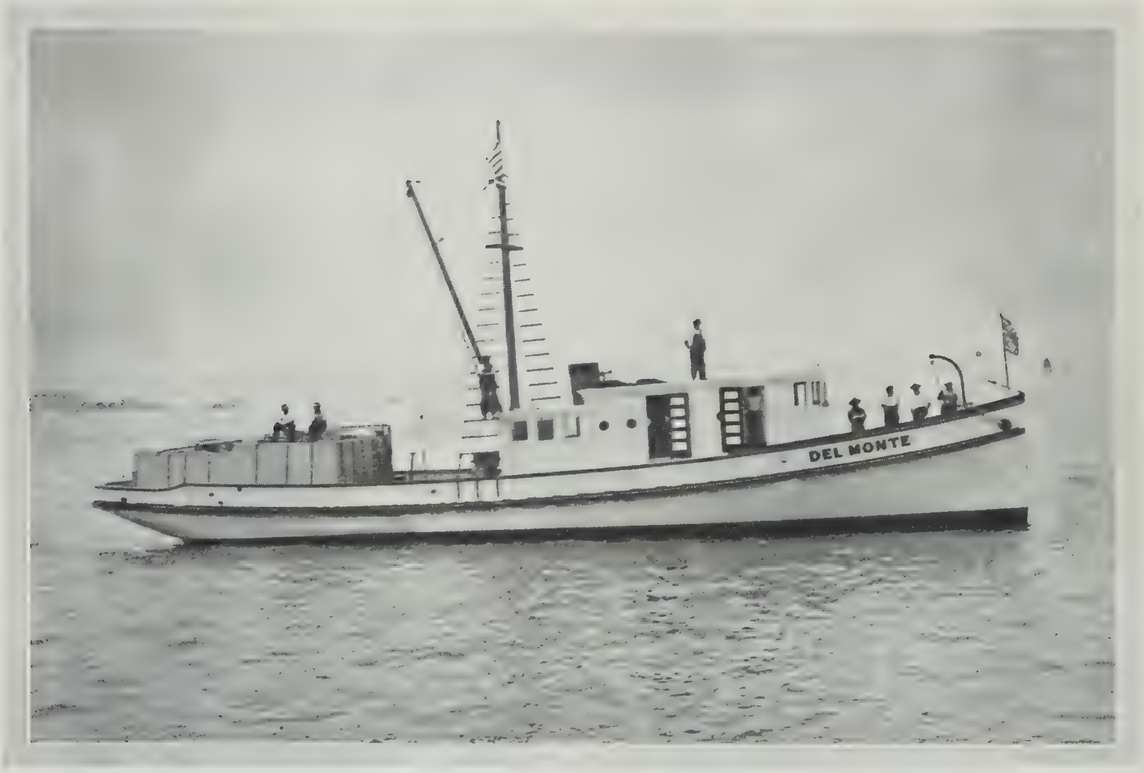

DEL MONTE

Owned by Manuel H. Freitas.

This vessel is under contract to the California Packing Corporation, packers of DEL MONTE Brand food products.

The Del Monte is of the following dimensions:

Length—88 feet.
Beam—21ft. 6in.
Draft—7ft. 6in.

Her speed is 12½ knots.

She is equipped with a 225 H.P. Direct Reversible UNION Diesel engine.

The boat was built by the Campbell Machine Company, San Diego distributors of UNION Diesel engines.

The "DEL MONTE" has a power driven anchor and cargo winch, a 32 volt lighting system, "Campbell" bait pump and large "live" bait boxes.

The after hold is cork insulated, forming a large ice box in which 90 tons of iced fish can be kept for thirty days.

Crew accommodations for 10 men.

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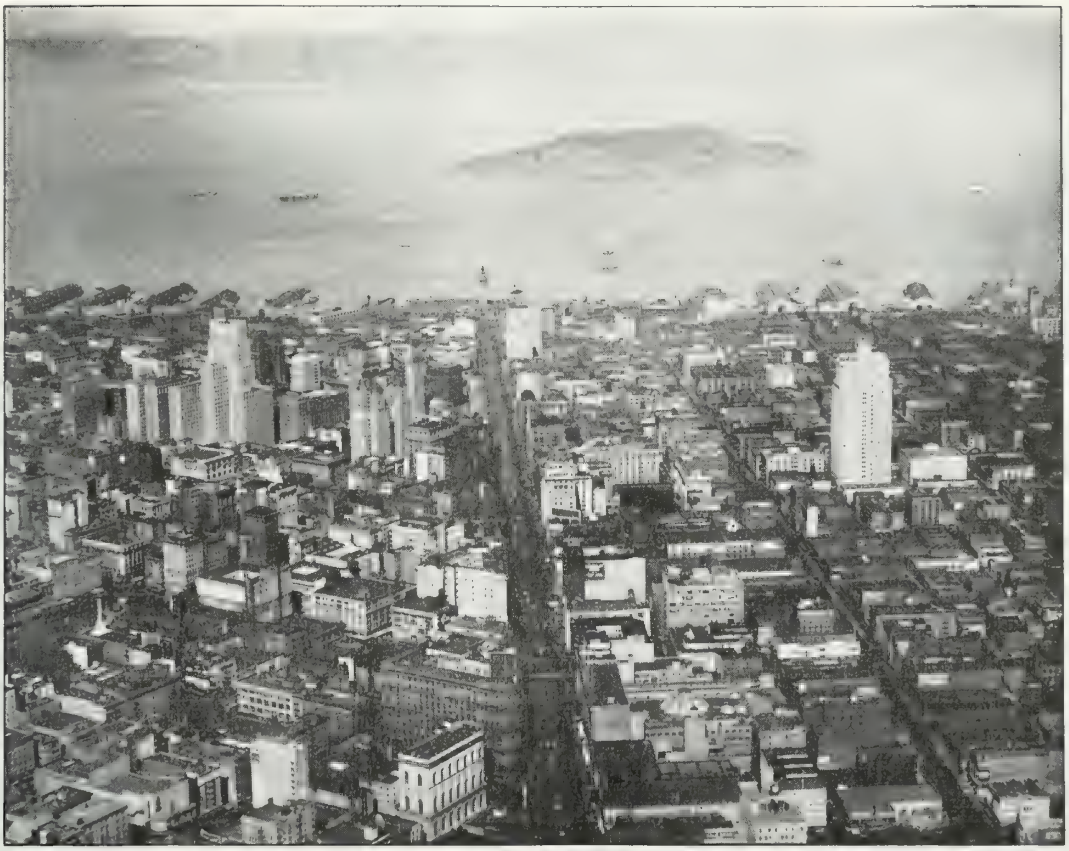
OAKLAND, CALIFORNIA, U.S.A.
ESTABLISHED 1885



San Francisco as seen by Colonel Lindbergh

An Aerograph of the Financial District, the Harbor and the East Bay Cities taken from a point above the Civic Centre.

(Copyright by Aerograph Company, Oakland, California)

WASHINGTON
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An Auxiliary as Reliable As the Main Engine

That familiar plaint, "If the small engine only ran as good as the big one!"—need be heard no longer.

The Washington-Estep Diesel Engine line is now broadened to include auxiliary units of 36 B.H.P. and up. In design and construction these units include all the features that have made the Washington-Estep Diesel an outstanding success for marine and stationary uses. These engines are built in a number of cylinder sizes and in units of 2 to 6 cylinders. They are direct connected on an extension base to suitable generator.

They are four-cycle, cold starting, full Diesel type, with simple, airless fuel injection, and force feed lubrication to all bearings. Parts are unusually accessible. Installation can be made in very close quarters if required.

This new Washington-Estep Diesel Engine will fully sustain the reputation these engines have made. For full information get in touch with us or any of our agents.

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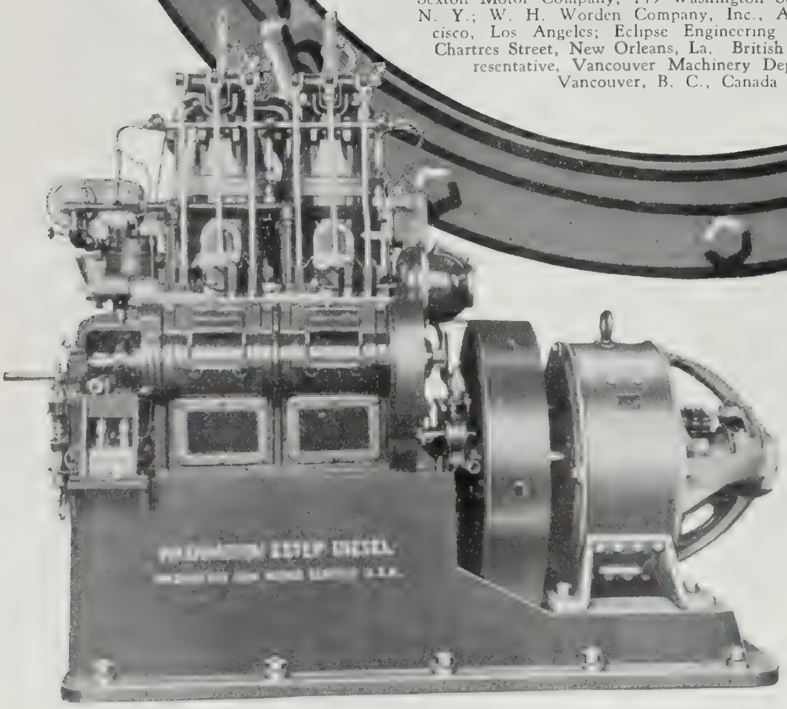

Removable Cylinder Liners—No expansion stresses on cylinder, consequently longer life.

Open Side Type—Easy access to crankshaft and all bearings.

Deep and Rigid Base—No danger of crankshaft breakage.

Pistons Removable from bottom through side plates.

Extra large Caged Valves, giving maximum power.

"WASHINGTON - ESTEP" DIESEL ENGINES

OCTOBER, 1927 VOL. XXIV., No. 10

Pacific Marine Review

The National Magazine of Shipping

Official Organ
Pacific American Steamship
Association

James S. Hines,
President and Publisher

Bernard N. De Rochie,
Vice-Pres. and Manager.

576 Sacramento Street, San Francisco

Member of Pacific Traffic Association

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Official Organ
Shipowners' Association
of the Pacific

Alexander J. Dickie,
Editor.

Paul Faulkner,
Advertising Manager

Pacific Foreign Trade Council

THE Pacific Foreign Trade Council, on September 15, held its fifth annual convention at Victoria, British Columbia, with William Piggot of Seattle, council president of the Pacific Foreign Trade Council and vice-president of the Pacific Coast Steel Company, presiding. The meeting featured the first gathering of this body outside the borders of the United States, and in this connection the council slogan "Pacific Coast Unity for World Trade Expansion through Greater Production, Industry, and Commerce" has special significance.

Manufacturers, merchants, agriculturists, transportation experts, bankers, importers, and exporters combine in the personnel of the council, which functions through the foreign trade divisions of the chambers of commerce of the Pacific Coast of North America, its purpose being to discuss methods of developing foreign and domestic commerce by cooperative efforts. That the council has been active in its work is attested to by the official recognition its efforts have received from Japan, Cuba, New Zealand, Great Britain, Italy, Bolivia, Brazil, Sweden, and The Netherlands.

Fifth Annual Convention
PACIFIC
FOREIGN TRADE
COUNCIL
Victoria, British Columbia, Canada
September 15, 16, 17, 1927

At the Victoria convention, as in all previous meetings, many excellent papers were read and much good fellowship enjoyed. Among the papers presented were: "Handicaps to Pacific Coast Shipping Interests and Recommendations for Remedial Measures," by John Ambler of Seattle; "European Demand for Pacific Coast Agricultural Products," by William A. Schoenfeld, United States Department of Agriculture; "Causes for High Insurance and Transportation Rates," by W. H. Hayden of Seattle; "Foreign Trade of British Columbia," by G. V. Holt, Canadian Bank of Commerce, Vancouver; "Pacific Coast Financing of Foreign Trade," by E. W. Wilson, president, Pacific National Bank, San Francisco; and "Development of Pacific Coast Manufactures for Foreign Markets," by W. W. Mitchell, Pacific Coast Vice-President, American Manufacturers' Export Association.

Keen regret was expressed on all sides when it was announced that Captain Robert Dollar, who has been a leading figure at all previous meetings and conventions of the council, was detained at home by illness.

The California

ON October 1, 1927, at Newport News, the great intercoastal passenger liner building for the Panama Pacific Line is being christened in the name of the Golden State. In many ways this event is significant of the commercial development of the Pacific Coast, of progress in American shipbuilding, and of advances in American marine engineering.

The California is the first of three practically identical, electrically driven passenger liners on order or to be built by the International Mercantile Marine Company for the Panama Pacific Line service from New York to California, a building program due to the demand for faster and finer intercoastal service to meet the phenomenal growth of Pacific Coast communities.

The California is the largest commercial steamship ever built in the United States and the largest electrically driven passenger vessel in the world. Her central power plant generates 15,200 kilowatts of electrical energy, which is used not only in propelling the vessel, but in operating every mechanism throughout the structure where power is required. All the pumps are electric-motor driven. The steering gear is electro-hydraulic, electrical refrigerating machinery will be installed, an electrical heating system will keep all quarters at comfortable temperature, electrically driven ventilating fans will insure cool air in the tropics, electrical cooking, dish washing, mixing, slicing, cutting, sharpening, and baking apparatus will be included in galley equipment, electrical control of clocks, electrical elevators, electrical radio will add to passenger comfort and pleasure.

The propulsion machinery follows the United States Navy standards. Its advantages are—smoothness of operation, giving maximum passenger comfort; high economy at cruising speeds (one generating set at full capacity operates both motors to get 70 per cent. speed of vessel); full power backing; and simplicity of control, giving great maneuverability.

The International Mercantile Marine Company deserves great credit for its recognition in this very substantial form of the growing demand for high class passenger accommodation in the intercoastal service. The California and her sister ships will meet and anticipate this demand and will have a long life of useful and profitable service.

Portland Radio River Reports

By O. N. Barnhill

THE Portland Merchants Exchange, cooperating with various steamship companies, has perfected a system of reporting by radio the position of ships between the mouth of the Columbia River and Portland. These reports are designed to replace those heretofore sent by wire from Astoria and other river points to ships' agents at Portland.

The telegraph messages cost 13 cents per word and the Merchants Exchange has been paying $100 a month for them. Ten radio river reports will cost no more than four land reports. The Federal Telegraph Company at Portland (KEK) will handle the wireless reports.

Pilots boarding ships at the mouth of the Columbia River will hand a report card (standard printed form) to the master of all vessels having wireless outfits, asking them to report to the Merchants Exchange the time of passing the following points: North Head, Astoria, St. Helens, mouth of Willamette River. If the vessel berths at Astoria, her time of arrival and departure at that port should be given. Outbound vessels report when passing North Head. This service is free to shipowners.

Inbound vessels scheduled to commence discharging cargo upon arrival at Portland are asked to report position of vessel at 3 o'clock in the afternoon. These supplementary reports will give stevedore companies a chance to figure on furnishing help to unload vessels. Inbound and outbound vessels delayed in the river will report position of vessel and time of delay.

"The purpose of this new radio river reporting service," explains J. S. Paterson, manager of the Merchants Exchange, "is to enable merchants, stevedore companies, ship agents and all others interested to keep more closely in touch with vessels making the Port of Portland. These reports will be received at any hour of the day or night.

"Our Exchange formerly was open from 7:30 a. m. until 6 p. m., but in the future will be kept open from 6 a. m. until 9 p. m., and it may be found necessary to keep open continuously. Our reports are free to all and are furnished to all interested parties."

Mr. Paterson, who had charge of the shipping department of the Hauser-Grain Company before assuming his present position, has for a long time been working on this new reporting system. The plan itself was simple enough to work out, but securing the cooperation of the various interested parties presented problems. The report card is signed not only by the Merchants Exchange, but by the Portland Steamship Owners' Association, Columbia River Pilots, and Columbia River Bar Pilots' Association.

A Notable Shipbuilding Program

AT a recent conference in Hamburg, the Hamburg-American Line authorized the building of eight vessels of three distinct types, with a total tonnage of 86,000 gross. All of these ships will be diesel driven. Two of them, to be named the St. Louis and Milwaukee, are for North Atlantic passenger service. In general appearance, they will be of the well-known Cleveland type, 500 feet long, 70 feet wide, 16,000 gross tons, with accommodations for 450 cabin, 300 tourist, and 40 third-class passengers. The motive equipment of these ships will consist of four 2-cycle, 6-cylinder diesel engines, each delivering 3050 shaft horsepower at 230 revolutions a minute. The vessels are to be twin screw, and the engines are arranged in pairs, each pair driving its propeller shaft through specially designed reduction gear, the propellers turning at 110 revolutions a minute. A total horsepower of 12,200 delivered to the twin screws will drive these ships at 16 knots. It is claimed that this latest type of high-speed diesel provides greater flexibility, occupies less space, and gives better economies and distribution of weights with less vibration than any other propulsive method now in use.

The second group of this building program will consist of four vessels of 9000-tons each, with a speed of 12 knots. These are of special interest to the Pacific Coast, as they will be named San Francisco, Los Angeles, Portland and Seattle. They will be freight carriers with a limited passenger capacity, operating between European ports and the west coast of North America. They are to be propelled by 3-cylinder, 2-cycle, double-acting Hesselman diesels. This group will all be ready for service in 1929.

The third group consists of two vessels of 9600 gross tons each, to be named Rio Orinoco and Rio Magdalena. These are to have a speed of 16 knots, with 6000 shaft horsepower diesel engines. They will be passenger carriers, with 250 first class and a limited number of intermediate class and are designed for service between Hamburg and the West Indies and Mexico. They will each be equipped with a very fine swimming pool and with an unusually large number of private baths, and it is expected that they will often be used for pleasure cruises.

The operation of the power plants of the St. Louis and the Milwaukee will be watched with considerable interest by students of marine diesel engineering and it will be very interesting to know just what the weights and the economies of this plant are on sea trials.

Hydrographic Survey of Panama Bay

By C. H. Calhoun

A COMPLETE hydrographic survey of the Bay of Panama, which is also the approach to and entrance to the Panama Canal from the Pacific, has never been made. The present charts are made up of a combination of surveys, some made over fifty years ago, and are not satisfactory for the increasing traffic using these waters, nor from a defense angle of the Panama Canal from the Pacific.

This need is to be met now by a survey that is being undertaken by the U. S. S. Niagara, under the command of Commander E. M. Baum, U. S. N., and the work, which has already started, is expected to take three or four years to complete. The survey will cover the area from Cape Mala on the west to Cocolita Point on the east, and will also include the Perlas Islands. The Niagara's work during the first season will be confined largely to triangulation, determination of geographic positions, and aerial photographic reconnaissance.

The most extensive surveys of these waters was made by the British Admiralty over a period extending from 1847 to 1849, when the traffic of the sailing vessels between the Isthmus of Panama and California was in its heydey. Then every vessel was crowded with passengers, either returning via the Isthmus with their stake of gold dust and nuggets, or anxious both to escape the pest hole of disease in Panama and to reach the California gold fields and make their fortunes. Relics of these days may be found today on Taboga Island near Panama in the deck house, wheel, builder's plate, and ship's bell, of the famous old Ayacucho, mentioned in Dana's classic "Two Years Before the Mast."

In addition to the surveys made by the British, the United States Coast and Geodetic Survey charted a small area over twenty years ago, and in 1922 a small section of the coast was surveyed by Panama Canal engineers for private interests. The U. S. S. Rochester, flagship of the Special Service Squadron, based at the Panama Canal, made a limited survey of waters adjacent to the entrance to the Panama Canal in 1924, and the French Canal Company carried out a survey of a small area in Balboa harbor in 1889. Consolidation of these surveys still leaves large areas uncharted.

The work of the British in Panama Bay was remarkably thorough, but hydrographic methods and equipment over half a century ago were not as adequate as they have since been developed. The charts in use at present show some geodetic distortions and some shoals and dangerous rocks are not shown, while the scale is too small for practical use. The increasing use of these waters by heavy traffic to and from the Pacific Coasts of the two Americas, has lead to this project for a complete survey, which will be of great aid to the navigation of vessels coming to the Panama Canal.

Shipping in Europe

By A. C. Holzapfel.[*]

THE impression prevails throughout Europe that shipping prospects are at last on the mend. Results in many cases of the past year's working have still been disappointing, but the large passenger lines have held their own and maintain moderate dividends. The passenger traffic this season has been exceptionally good, and the big liners must have made handsome profits and are doing so at this time. Tramp shipping has also been able to get some improved returns. The unsatisfactory condition of the freight market is, of course, due to the artificial barriers to international trade resulting from the tariffs which were adopted by the different countries as an aftermath of the war. Many of these have now been modified and resulted in an increase of international trade, but much remains to be done in this connection.

Shipbuilders have suffered very severely and large shipbuilding and steel companies in England such as Armstrongs, Vickers, Cammel-Laird, and John Brown and Company have passed through severe crises and their shares and bonds have enormously depreciated.

Labor, of course, has also been a difficult problem and particularly in England where the output per man per day seems to have materially decreased, the motive of workmen apparently being to reduce the output in order to give a chance to the unemployed, forgetting at the same time that their action was tapping the roots of national prosperity.

Shipping in Italy has advanced to a remarkable extent, a very progressive policy in regard to the type of vessel produced having been adopted. German shipbuilders have not been very successful lately and various consolidations have taken place with the view of reducing expenses. Dutch ship builders seem to have been fairly successful.

On the whole, shipbuilding and shipping generally in Europe appear to have overcome the crisis and to have started on a steady growth of reconstruction. Let us hope that Congress will have the wisdom to pass such measures as may enable American shipbuilders and shipowners to keep in line with Europe in this very important industry.

Converted Tanker Makes Good

THE Point Breeze 7000-ton diesel-electric tanker just completed by the Atlantic Refining Company at its Point Breeze plant, has had her trial runs and sailed August 29 on her maiden voyage to Europe, with a cargo. Trials were run throughout the week ending August 28.

This boat, originally the J. M. Connally, was purchased with two others, from the United States Shipping Board and converted to diesel-electric drive under the personal supervision of L. M. Goldsmith, technical engineer of the company. The remaining boats, the Sharon and the Bessemer, are being reconditioned by the Alabama Dry Dock & Shipbuilding Company at Mobile, and it will probably be a few months before the next one will go into service.

All three boats will probably be operated in coastwise service, but may occasionally be used in foreign service between American ports and South Africa or Europe. The former propulsion was of the steam type, but the new power plants will each consist of Ingersoll-Rand diesel engines and electric equipment furnished by the General Electric Company. Each tanker is to be equipped with three 850-horsepower, 225 revolutions per minute, diesel engines, each driving a 525-kilowatt, 250-volt generator for propulsion and a 50-kilowatt, 250-volt auxiliary generator for excitation and ship's auxiliary power. The propulsion genrators will supply power to an 1800-horsepower 90 revolutions per minute, 750-volt, double motor on each boat, direct connected to the propeller shaft. The control will be of the variable voltage type arranged for operation either from the pilot house or the engine room, the control panels being of the dead-front type.

The tankers will be fitted with electric auxiliaries all of which will be driven by General Electric motors. The auxiliaries will include two 80-horsepower cargo pumps, one 45-horsepower windlass, one 30-horsepower mooring winch, one 30-horsepower fire and bilge pump, two 15-horsepower air compressors, a balancer set and numerous small pumps—as well as a 25-kilowatt auxiliary generator driven by an oil engine for emergency use in port.

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[*] A. C. Holzapfel, president of the International Compositions Company, is a recognized authority on international shipping and shipbuilding, of which industries he has been a close student for over fifty years, He wrote the above notes, summarizing the impressions of a recent visit to Europe, on September 7, almost immediately after his return to New York.

The Future of Aviation

By J. Frederick Richardson*

WHEN Colonel Charles Lindbergh, 24-year-old aviator, rose in his silvered airplane through the mists overhanging San Diego, by the shores of the Sunset Sea, and flew into the dawn of a great adventure, the wheel of human destiny had begun to make another turn in man's evolution in transportation that was to liberate him from land or waterbound travel into the ether with the birds, just as, ages ago, man's discovery of navigation of water by means of a log, released him from his land-locked prison and gave him a new method of transportation. And when Colonel Lindbergh, crossing the North American continent in two hops, paused in New York long enough to take on a few sandwiches, a little water and fuel, and then flew to Paris landing on Le Bourget field, he did something more than write another glorious page in the history of America's accomplishments in golden letters of superb daring, rare judgment, and consummate modesty. He wrote on the grey sky of the storm-stressed Atlantic in the smoke of his motor's exhaust, "Finis" to America's isolation from the Old Countries of the world.

Before his epochal flight, this country was more than three thousand miles across a desolate stretch of storm-tossed ocean from the joys, the hates, the greed, the envy, the poverty, and the commerce of Europe. Once the flight was made we were but 33½ hours from all that and were for all time inextricably linked to the potentialities of the Old World for better or for worse. When, scarcely two weeks later, Chamberlin flew further and longer, to land in Germany, he demonstrated that the Lindbergh flight was due not so much to "Lindbergh luck" as to Lindbergh courage and Lindbergh judgment.

When a little later Byrd and his brave companions flew across to settle—like the true sea-gulls they are—in the water instead of on the land, they but added proof that man's evolution in transportation from water to air had arrived—the wheel of destiny had turned. Likewise Maitland and Hegenberger, in their historic flight to Honolulu, demonstrated that the Pacific, as well as the Atlantic, was conquered by the airplane, and they were soon followed by Smith and Bronte, and the Dole prize flyers.

These flights demonstrated another fact of the most vital importance to this nation—that just tomorrow, so to speak, will come the plane that can fly from New York to Paris, or from San Francisco to Honolulu—even to Tokio or Shanghai—and, turning about, fly back again without landing until it gets to its home port. That plane might as easily start from some other country, and be flown by the illustrious son of some other nation, as from our own. What then?

Air Defense

Lindbergh, Chamberlin, Byrd, Maitland, Smith, Bronte—all these flew for some purpose other than merely to gain fame and glory, or a cash prize. That great reason was to show America what her defense in the air must be in the future. It was to show us that if we are to maintain our place in the sun, and be secure in our commanding position in the sisterhood of nations, we must build up a commercial air fleet and do it promptly. Since these men and a woman have done these things—not for the prize money—for who would deliberately lay down his life for twenty-five thousand dollars if offered the chance?—but for the deeper reason, what, then is the future of aviation?

Commercial Fleet Necessary

The United States could not possibly maintain a sufficient supply of airplanes to meet even the first phase of a war of the future, because the airplane is too rapidly rendered obsolescent by the constant development and advance in the art of flying and the science of construction. So, it is upon a commercial air fleet, born of a transportation need, and nourished by the patronage of the people of this country, that the government must depend for its defensive air reserve.

That commercial fleet must be built from the bottom, so to speak. Since engineering and construction forces must produce from nothing a commercial air transportation utility, it is easy for government not only to see to it that such a structure is so built as to be cheaply and readily convertible to defensive military purposes, but the government can afford, and undoubtedly will have to grant, generous subsidies to aid such building. The government can do that and reap a great profit. When we stop to remember that nearly a billion dollars of the taxpayers' money was spent in a futile, hysterical effort to build an aerial fleet in the last war and not a plane was delivered to the front, we begin to perceive that the government can save much of our money by controlling the development of the commercial aerial fleet and escaping another such fiasco in event of an emergency.

In the five years following the Armistice this government spent $82,000,000 a year for aviation, and yet the Lassiter Board, after an extensive survey of the Air Services, was forced to report that "Our defensive air service is in very bad condition and will in a short time disappear so far as military requirements are concerned." My own investigations revealed the same state of affairs.

This country, if it is to do its share toward maintaining the peace of the world, has its greatest opportunity in its development of a commercial aerial fleet. It rests with us, the richest and most powerful single nation on the face of the globe, as to whether the airplane becomes a dove of peace or a vulture of war; and as to whether the splendid feats of superb courage written into the history of our country's accomplishments shall be prostituted to the destruction of civilization or be dedicated to the advancement of man's welfare and happiness.

The paths of peace lie along the highways of service—and transportation is service. The philosophy of transportation is the removal of products or persons from the point where they are to a point where they are more needed. The philosophy of barter and trade, now called commerce, is that of service—the exchange of goods or human effort to the mutual benefit of those engaged in that exchange. The future of aviation depends, in the light of this philosophy, wholly upon whether or not it offers a swift, safe, economical method of transportation and, to a vital degree, upon the method of its financing.

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*Editor's Note: J. Frederick Richardson is a recognized world authority on aviation. Having been interested as an investigator in the subject since 1912, he was chosen as the chief consulting investigator of the Sixty-eighth and Sixty-ninth Congressional Select Committee of Investigation into the United States Army Air Service, the Naval Bureau of Aeronautics, the Postal Air Mail Service, and Commercial Aviation. In these investigations Mr. Richardson spent a part of his time abroad, and is the author of "Richardson's Analysis of the Air Strength of European Countries," made to the Sixty-Ninth Congress. Mr. Richardson is now vice-director General of Pacific Foreign Trade and Travel Exposition to be held in San Francisco November 11 to 20, 1927.

Economy of Aviation

Economy is relative. Some cargoes now carried by airplanes, such as financial documents governing commercial transactions, small parts for great machines, which must be silent until the part is received and installed, and commodities of a highly valuable, concentrated character, such as diamonds, in which the frozen investment and interest are great during the period of transportation, all can be and are now economically carried by airplanes.

Then, too, quantity production of airplanes will greatly reduce the per unit plane cost as it has done in automobiles and other things. An engineering staff costs so much and spends so much in developing a type of plane or an improvement in a plane, and when standardized production is reached that cost will be no greater for a hundred planes than it is now for one. Yet the per unit plane cost would be reduced to a hundredth part. The motor is one of the great cost factors in the airplane, and standardization, coupled with quantity production, will achieve great reductions in the cost of the motors.

Another costly impediment in the way of economical aerial transportation is the lack of landing fields and night flying facilities. While the first cost of these are very great, once established, the maintenance cost of landing fields and beacon lighting systems will be small, and since these facilities can be used by any number of planes within reason, the per unit plane cost would become infinitesimal. Then again, the small investment required in the planes themselves, the absence of necessity for the acquirement or maintenance of a right of way, the vast distances which can be covered by an airplane with one pilot, and the saving in time all operate to reduce, in a short time, the cost of airplane transportation to nearly a parity, all things considered, with present express rates.

So we find that the airplane does offer a swift and economical transportation utility.

Safety of Aviation

As to its being safe, we have but to turn to German commercial aviation, which in two years carried more than 55,000 passengers more than 3,000,000 miles with but two fatalities—one fatality to more than a million and a half miles of flight.

The United States government blazed the airtrails of this continent, and now private companies have taken over the work on a purely commercial basis with a profit-taking intent. During 1926, the transcontinental air lines operated over 1,860,190 miles on schedule, through all seasons, all sorts of weather, day and night flying, and over all kinds of terrain, with remarkably few accidents. The greatest hazard to goods or passengers in airplane transportation is the landing. The next greatest hazard is the take-off, getting the plane with its load into the air. So long as the plane is actually in the air it is as safe as grandmother's feather bed. With the establishment of flying fields and lighting beacons at more frequent intervals these two hazards will almost entirely disappear and accidents will become rare.

Profits in Aviation

As to whether commercial aviation can become generally profitable in time, I think the present air mail contracts prove the point. The National Air Transport Company, holding the government mail transportation contract on the route between New York and Chicago, carries the mails at a rate of $1.24 a pound. The Boeing Airplane Company of Seattle, holding the contract for mail transportation between Chicago and San Francisco, performs the service for $1.50 a pound. The government receives $3 a pound for handling the air mails, so everybody concerned makes a profit, albeit the airplane companies are not making much profit. And yet a citizen in San Francisco can post a letter, and for 10 cents that letter will be delivered to the addressee in New York as quickly as a similar letter posted in San Francisco at the same time would be delivered to an addressee in Oakland, across the bay, if the letter were posted on Saturday.

Future

As to its future development, we have but to remember that it was 24 years from the day when the Wright Brothers for the first time in man's history made the first successful man-carrying flight in a heavier-than-air vehicle and brought to reality man's ages-old dream of flying like the birds, that the 24-year-old Lindbergh spanned a continent and a sea, to realize what strides the art of flying has made.

So it becomes obvious that national defense requirements, the necessity for this nation leading the peoples of the world into the paths of peace along the highways of human service, and the swift, safe, economical transportation utility offered by the airplane mean that its future is assured. It has not superseded and will not supersede the steamship as a mode of ocean transportation except in a very few commodities and in the case of a few persons. These transoceanic flights do not demonstrate that the time has arrived when bulk commodities and wholesale passenger traffic can be safely and economically carried across the seas in airplanes. The most enthusiastic aviation fans must realize the fact that airplanes can now scarcely carry enough fuel to propel them across the oceans and that much is yet to be done in development before bulk commodities can be so carried.

In the development of the airplane industry, however, the wisdom of government subsidies properly spent in the growth and maintenance of aerial fleets will be seen and the prejudice that exists in this country against the very term "subsidy" will fade. That prejudice is based on events of the past which are as far out of date now as the ox-cart. So, when the wisdom of governmental subsidies becomes apparent, and when we realize that we must lead the world in a mercantile marine as well as in a commercial air fleet if we are to pilot the peoples of the earth into the havens of peace along the highways of service, the shipping industry will come into its own. It, too, will benefit by legislation and by government aids, as it should have been doing all this time.

So it is up to the people of this country, who in the last analysis, have to pay for these fleets, and who have to pay for the wars and fight them as well, and who should reap the profits of peaceful commerce, to indicate to the Congress their desire for the development of an ocean fleet supplemented by an aerial fleet that shall transport the world into the paths of peace, prosperity, and happiness.

Load Line Legislation

Some Notes on the Development and Present Status of the American Load Line Situation

By Clergue C. Schilling

THE fact that a policy is general is not in itself proof of the desirability of such policy, but it is a practical argument which frequently impels the minority to accept the views of the majority. This is the situation concerning load line laws. The United States is the one maritime nation having no such law. This has resulted in frequent embarrassment to vessels of the United States and in some instances to an actual loss of time in order that a ship might comply with the load line requirements of some foreign country at whose ports our ships were loading or unloading cargo.

Great Britain, our outstanding competitor, has had such a statutory obligation since 1875. This action was soon followed by France, Italy, Germany, Japan, Norway, and Spain. Each of these countries accepted the British Plimsoll designation and none varied materially from the general policies of the British law. It is not seriously disputed that the idea of a load line to indicate the depth to which a ship in salt water could be loaded safely was conceived by the underwriters and insurers. The preliminary effort started in 1873 when Parliament permitted the Board of Trade to detain overladen ships. This board formulated the tables of freeboard which in 1890 became the legislative table in defining the location of the load line disc. The British Lloyds were identified in the first activities, and they with their foreign associate companies have been conspicuous in similar legislation adopted by the other nations. The desirability and practical necessity for a load line has long become an accepted view. Any dissension has been confined to the details and application rather than to the fundamental rule itself.

Several attempts have been made in Congress to adopt an American Load Line. If there is an explanation why the United States did not follow the other maritime nations in the adoption of a load marking it does not appear in the available records of Congress. Bills were introduced in the early nineties and in almost every session of Congress from that time up to the present. The early efforts attracted little or no attention probably due to a committee arrangement which was virtually a gentleman's agreement and probably due to the additional reason that from 1890 to 1920 American shipping was an annually decreasing factor as a competitor. The trouble, therefore, became a reality only after the close of the World War when our ships became potential competitors of our European and Oriental neighbors. It has been during this period that American ships have been summarily detained in foreign ports until the ships have adopted the compulsory markings of such country. These detentions were not technical but a direct blow obviously for the purpose of embarrassing and hindering American ships.

Our neighbors have invoked their laws only when our competition became annoying or threatening. It was to meet this situation that in 1919 H. R. 3621 and S. 575 were introduced in the House and Senate. The acceptability of such legislation is somewhat reflected in the fact that H. R. 3621 passed the House without opposition and was substituted for S. 575 in the Senate. The measure would have been enacted into law but for the discovery that the bill required vessels on the Great Lakes and in the coastwise trades to adopt the load line. The opposition of these two forces developed while the bill was being considered by the Senate and resulted in the measure being detained in committee, thus failing of passage.

In 1921, H. R. 3708 was introduced. This bill carried approximately the same provisions as H. R. 3621 in the preceding session. This was likewise opposed by the Great Lakes and coastwise trades and was not reported to the House. It should be noted here that these measures had the endorsement of the Department of Commerce, the United States Shipping Board, and the transoceanic shippers on both the Atlantic and Pacific.

As heretofore suggested, the real necessity for a load line was confined to our foreign trade. To accomplish this result and to avoid the opposition heretofore directed at the legislation, H. R. 7245 was introduced in 1926. This bill specifically eliminated coastwise and Great Lakes trades from the provisions of the law. Like the preceding bills it had the endorsement of the Department of Commerce and the shipping interests. The two objections to the bill emanated from the tanker trade of the South Atlantic and the lumber hooker from Puget Sound. These two objections were met by inserting a provision in the bill which permitted an exercise of discretion on the part of the Secretary of Commerce to meet a similar power granted under the British Load Line Law. This measure became entangled in the legislative jam at the last session of Congress, occasioned by the Senate's adherence to that section of the Constitution which insures the freedom of speech.

A measure similar to H. R. 7245 will undoubtedly be introduced in the Seventieth Congress, and unless unforseen and unexpected opposition arises it will become a law. Our ships are already handicapped in many ways and it would seem indefensible to further handicap them by neglecting to place on the statute books a law which imposes no real burden on the operator but does remove an injurious obstacle, the utilization of which is always available to our foreign competitor.

If the United States is to maintain a Merchant Marine, worthy of the name, it is essential that the lawmakers at Washington direct their efforts to legislation which will promote instead of curtail navigation. It would be a most happy application to this business industry if there was less government in business, but if it is necessary to supervise or control our ships in foreign waters such legislative direction should in practice stimulate the trade and not hamper it. The common statement in the preamble that the purpose of the law is "to promote an American merchant marine" has almost become a vocal assuage.

Radio---Past, Present and Future

**By G. Harold Porter, Manager,
Pacific Division, Radio Corporation of America**

RADIO dates back to the early wireless experiments of the Italian youth Guglielmo Marconi in the closing years of the last century. While the propagation and the detection of electro-magnetic waves through space were well known phenomena to savants and laboratory workers, it remained for young Marconi to envisage the commercial possibilities in harnessing these waves to flash intelligence from point to point. Working toward the realization of this goal he first spanned distances measured in feet; shortly after, in hundreds of feet and it was not long before he lengthened his experiments to miles. In England, Marconi found sympathetic minds willing to aid him in the commercialization of the idea. And so started this gigantic development now collectively known as radio.

G. Harold Porter, manager of the Pacific Division, Radio Corporation of America.

For years the struggling wireless art found its application in the maritime world. Radio apparatus was installed aboard a few ships. Land stations were provided to furnish the link with the shore. Then in 1909 came an incident which served to crystallize for the benefit of humanity the inestimable value of radio at sea. The steamship Republic met in collision with the Italian ship Florida off Nantucket. The crash came in the middle of the night, and the first call for help flashed by a wireless operator thrilled a startled world. This was the famous CQD signal sent out by Jack Binns, whose coolness and presence of mind resulted in the saving of the lives of 1500 men, women, and children on the sinking ship.

It soon became compulsory by international law for all seagoing vessels carrying 50 persons or more to carry radio apparatus and competent operators. And one by one the passenger ships, followed by lumbering freighters and even tramp ships, were equipped with radio, while land stations grew in numbers to provide the necessary contact with land.

Marine radio, to give it the modern name, has more than kept pace with the rapid developments in the newer branches of the radio art. Today the latest type of equipment is installed on shipboard, with a corresponding improvement in the facilities of the land stations. Vacuum tube transmitters, with their powerful, sharply tuned, clean-cut continuous-wave signals, have to a great extent replaced the early spark and arc transmitters, facilitating rapid changes in wavelength so as to provide more communication channels, providing a better signal to combat interference, and in most instances more than tripling the former communication range.

The present-day marine stations of the Radio Corporation of America resemble nothing so much as a telephone central, with the plurality of transmitters and receivers and many operators on duty to permit the simultaneous operation of a number of radio circuits to and from ships at sea.

Not only does radio provide the navigator with constant and reliable communication with other ships and shore, but it contributes to safety in the actual navigation of the ship itself. In the radio direction finder or radio compass, the navigator finds the greatest aid since the Chinese invented the magnetic compass. This latter-day device, in combination with radio beacons established at strategic points along our coasts, enables him to take bearings on known points and in locating other ships by means of their radio signals, despite the blackest night or the densest fog. By means of this device, courses are now laid straight to a given point and the navigator proceeds ahead with the full assurance of safety.

Yet all the while that radio has followed the activities of the sea, it has progressed in other directions. In fact, it became manifest long ago that this communication method might be employed in spanning even greater distances. It was in 1907 that the first transoceanic wireless feat was accomplished between Ireland and Nova Scotia, and in 1908 this circuit was opened for public use. Other high-power stations soon followed. It became apparent at this time that commercial ambitions had grown far in advance of the art. The key to constant, reliable, transoceanic service had not yet been found. Existing equipment could not generate sufficient power in suitable form to transmit radio messages continuously across the Atlantic.

It remained for the grave emergency of the World War to bring home to the people of the United States the necessity for an independent and reliable communication service to all countries of the world, free from censorship, delays, relays, and other obstruction. Meanwhile, the United States took the lead in technical research and invention, with the notable development of the Alexanderson alternator, and improved radio receivers which, for the first time, made possible continuous and economical radio communication over great distances. The technical means of long-distance radio communication was now at hand. All that remained was the organization of capital and facilities and personnel to carry out the American world-wide communication service to a complete actuality.

In the year 1919, the radio stations of the world were once more released for commercial service. It was in April of that year that the Radio Corporation of America was born out of the necessity of centralizing American radio efforts, and at the urgent invitation of the government. This organization, amply financed, immediately purchased the property of the British-controlled Marconi Company, secured rights under the important American patents, and quickly placed in service a number of stations connecting, across the Atlantic, with England, France, Germany, and Norway, as well as across the Pacific to Hawaii and Japan.

In the intervening years the progress of American world-wide radio service has been remarkable. Today the Radio Corporation of America is operating direct, high-power radio circuits between New York City and England, France, Germany, Sweden, Norway, Holland, Poland, Italy, Argentina and Brazil. Transpacific radio circuits are in operation between San Francisco and Hawaii and Japan, as well as to Java. A few weeks ago still another service was added direct to the Philippines. Soon we may expect service to several more Latin-American countries, and to China and other Far Eastern nations.

In the short span of six years, then, the American nation has achieved a development fully comparable to that of the British cable system with London as the hub, which required a half century or more of constant effort. Although still in its infancy, the American world-wide network is handling a fair share of international traffic—approximately 25 per cent of the total traffic across the Atlantic, with 75 per cent left to some nineteen submarine cables, and 50 per cent on the Pacific side, with the even balance to the limited cable facilities.

Radio has not only assured reliable, direct, unhampered communication between the American people and the outside world. It has also scored a marked economic gain because of the speed with which radio traffic can be handled by the use of automatic transmitters and recorders. Ample power is available for spanning the transoceanic gaps, so that time-consuming repetitions are no longer required. These economic gains have been reflected in lowered transmission rates, not only by radio itself but also by the cables compelled to meet their first competition in five decades or more of existence.

Transoceanic radio has gone still further ahead in anticipating the future demands of the human race, ever knitting distant points and separated peoples together into the closely woven fabric of international trade. The photoradiogram or image transmitting system, has been developed rapidly during recent years to a point where it is now possible to transmit entire messages as units, in facsimile form, without the double translation process imposed by the usual telegraphic code. Letters, type matter, photographs, drawings, checks, commercial papers, maps—anything, in fact—can be sent as a unit by means of photoradio over existing radio circuits without change in equipment other than the addition of the photoradiogram transmitter and receiver. Already the photoradiogram service is in extensive use; it is being steadily refined and new uses are daily being found for it.

Marine and transoceanic radio deal with private communication, point-to-point communication, individualized radio, in brief. But in 1920 the Westinghouse Electric and Manufacturing Company, experimenting with radio telephone transmitters, invited a handful of the then existing radio amateurs to listen in and report the results of the transmission. Then, almost over night, radio found an entirely new and unexplored field—mass communication—communication on an enormous and broadcast scale. So did radio broadcasting come into existence. Beginning with the pioneer broadcasting station KDKA in Pittsburgh, other stations were rapidly established throughout the land until the number grew to many hundreds.

The broadcasting phase of radio communication has of necessity been closer to the general public. It has penetrated into the home circle and become an intimate part of everyday life. Many of us sometimes wonder, and with due cause, what our lives would now be without this broad contact with the outside world. Broadcasting technique has made enormous strides. At first the mere novelty of bringing voice and music into the home was sufficient to warrant the keenest interest on the part of the public. Later, however, as this novelty wore off, there came an insistent demand for real speech and real music. Then, with the attainment of utmost realism in radio rendition, there came before the microphone the world's greatest musicians and professional talent, in place of the erstwhile phonographic and automatic piano music, commonplace talks and lectures, and the mediocre musical talent which had been the routine in the pioneer days of broadcasting.

Increased power, both at the transmitting and the receiving ends, has come to solve the problem of year-round reliable radio service. Network broadcasting has brought the national centers, with their wealth of entertainment, enlightenment, and important events, into the immediate neighborhood of all homes in cities and hamlets and rural districts.

Broadcasting has been the greatest experiment of modern times. It began as a mere test in radio telephone transmission. It developed as an experiment, so far as the economics of the thing were concerned. Costs rose rapidly with the demand for better programs. Nationwide programs came to take the place of the individual programs, in large part, and required a unified broadcasting system. A national organization, therefore, became the urgent need.

It remained for the Radio Corporation of America, already charged with the stewardship of the nation's marine and transoceanic radio facilities, to insure the permanency of the broadcasting institution. Accordingly, this company, in cooperation with its associates, the General Electric Company and the Westinghouse Electric and Manufacturing Company, which had been operating the leading noncommercial stations of the nation, formed the National Broadcasting Company as a solemn pledge to the owners of radio receivers that they would never want for good radio programs. The newly formed organization became owner of the well-known station WEAF in New York, together with the vast network facilities, as the nucleus of its forthcoming activities. Shortly after, station WJZ of New York City was turned over to the management of the National Broadcasting Company. Two vast systems, the Red and Blue Networks, with these two stations as the key stations, became organized to serve the greater part of the nation. Still later, came the formation of the Orange Network on the Pacific Coast, completing the nationwide coverage. In this manner, a coast-to-coast super-network has been realized for the broadcasting of national events and program features. The climax of the NBC gigantic network facilities came recently in the broadcasting of the homecoming of Colonel Charles Lindbergh from his New York to Paris flight, when the Red, Blue, and Orange networks were coupled together with a total of fifty stations. Here became assembled the greatest audience of history—over 35,000,000 people, scattered from Maine to California. Radio announcers and microphones were installed at every vantage point to provide a running description, together with the atmosphere of noises and whistles and roars, in bringing to every listener the full benefit of the event. Some 14,000 miles of

(Continued on Page 458)

A Voyage to Australia in an Emigrant Sailing Ship Forty Years Ago

By James W. Casey, Seaman

The barque Rialto from a wash drawing by W. Francis of Seattle, based on information and a sketch by James W. Casey.

IN the month of August, 1883, while passing through the East India Docks, London, my attention was drawn to a ship with a large sign stretched across her bows announcing that she was under charter to the government to transport emigrants from Plymouth to Sydney, New South Wales. I had recently returned from a voyage before the mast out to India and return in the ship Zenobia, originally a sidewheel steamer built at Bombay, the trip as a whole having been very tedious and rather hard. As emigrant ships in government service those days carried double crews, the sign I saw suggested a possible opportunity to make an easy voyage, as well as a chance to look into conditions in the Antipodes, which latter idea I had often had in mind. I, therefore, boarded the vessel, the Rialto of Liverpool, to inquire about chances for shipping as seaman for the outward trip.

The master, Captain Williamson, was agreeable to shipping me, paying one month's wages for the run out, of which one-half would be advanced when signing on and the other half after arrival at Sydney. Grog was to be served every evening and an allowance of one pound of tobacco issued monthly to each man. The regulation "pound and pint" articles were not necessarily to be adhered to, the captain stating that the rule would be "full and plenty," and I will here state that all these promises were lived up to, in fact, were more than fulfilled. As both Captain Williamson and his ship presented a favorable appearance, I did not hesitate in agreeing to become a member of the crew and never in my long career as seaman or ship's officer did I have as equally an enjoyable voyage.

Within a few days, everything being ready and the emigrants' quarters fitted up and properly equipped, the Rialto was towed out of the docks and dropped by the tug off Dungeness. With a light westerly wind and much foggy weather the run of 300 miles to Plymouth was a dead beat all the way and occupied some ten days. Soon after dropping anchor in the harbor, our passengers, numbering about two hundred and fifty, were brought off in a large tender and assigned to their quarters. They were quiet and orderly, as the government had accepted only those of good character. By nightfall all had been established and were making themselves at home. An anchor watch was set and the night passed quietly. At six o'clock the next morning the Rialto was towed outside the harbor, sail was made, and the voyage commenced. Our passengers bade farewell to their homeland and as its shores faded from view turned their thoughts to the promised land, many thousand miles distant.

The Rialto had been built in Sunderland in 1868 and was of the ordinary type of ship of her time, with painted ports as was then very common. Originally a full rigged ship, the yards on the mizzen mast had been sent down a short time before, leaving her a barque, with a main skysail. She was of 1200 tons burden, 210 feet long, with a beam of 36 feet. All the cargo she carried on this voyage, principally government stores, was stowed in the lower hold so that she had a good freeboard and proved to be a very comfortable and weatherly ship. She carried three mates, twenty-eight able and six ordinary seamen, six apprentices, and a boatswain, a carpenter, a sailmaker, and an engineer who had charge of the condensing apparatus. The crew was a motley assortment of English, Scotch, Welsh, Scandinavians, Finns, and Americans, and as a whole, was a body of men which any shipmaster would be proud to command. In charge of the emigrants there were a government agent, a doctor, and a matron.

A house on deck extended from the foremast to near the main hatch. The forward section of this was occupied by the carpenter and the other petty officers. Aft of this was the crew's gallery, then the emigrants' galley. The after end was the engine room. The poop deck cabin accommodated the captain, mates, and steward. The regular crew's quarters were in the forecastle. Those of the extra crew were below this in the close and stuffy fore peak, but this was occupied only in cold or rainy weather.

The forward portion of the 'tween or berth deck had tiers of bunks three high along each side of the vessel, with a few rows athwartship. This was the section reserved for the single men. The quarters of the married couples were amidships, also ranged along the ship's sides but were partitioned off and fitted with curtains of a heavy material. The single women, of whom there were about eighty, were berthed aft in charge of the matron. They were never allowed to go forward of the poop deck and if they had relatives on board could meet them only on Sundays in the presence of the matron.

The mess tables lowered up and down and when not in use were triced to the upped deck beams. A good broad ladder led from the berth deck to the main deck through a companionway. Considering the type of vessel in which they were making the voyage, it did not seem possible that the passengers could have had more convenient or comfortable accommodations, and so far as the crew ever heard there were no complaints made.

As to food, all supplies were of good quality and were ample in quantity, besides which everything was well prepared and served. The emigrants and the crew fared nearly the same. In addition to unlimited hard tack, the crew was served every day with soft bread, butter and marmalade, and were allowed milk with their coffee. The emigrants' cook was a master of his art and had plenty of helpers, who, with a full corps of waiters, were selected from among the passengers. Their eight o'clock breakfast always included oatmeal mush, hot rolls, a sauce of dried apples, and coffee. Dinner was served at 11 a. m., with salf beef and pork three times weekly and preserved meats the other days, always with the old stand-by, pea soup. Of this latter the emigrants were so fond as to often draw on the forecastle galley for a supply between meals. On Sundays, a sea pie, something like an American pot pie, was always hailed with delight. Every Friday afternoon the lower hold was opened up to break out needed stores and baggage and on these occasions it was a common occurrence for a case of milk or a package of some other "dainty" to get mis-stowed and eventually find its way into the forecastle.

At 8 o'clock in the evening of the first day out from Plymouth the crew were called aft to hear the reading of the rules and regulations, with penalties for infractions. Men to police or keep watch at night in the berth deck were drafted from the passengers. A seaman was stationed at each hatchway, who, on getting word from below every hour, would sing out to the watch officer, "All's well, fore hatchway" or "All's well, main hatchway," which calls would be answered by the officer's drawn out "All right."

The first week of the voyage was one of very disagreeable, squally weather and nearly all our passengers became very seasick. A long spell of variable and light winds was then encountered and by the time the equator was crossed, on the thirty-fifth day out, all on board had their sea legs on and were in good spirits. The male passengers were always anxious to assist in deck work, such as pulling the yards around, but they were never able to fully appreciate the meaning of the word "belay" and continued to pull and haul just the same. At best there was not much deck room, due to the necessarily large number of wash-rooms, toilets, etc. No work aloft except what was absolutely necessary was ever done during daylight hours for fear of some gear falling.

One fine night in the southwest trades, while a concert was on in the "hall" (a simple construction of rafters and a tarpaulin), the main topsail halliards carried away and the heavy chain runner fell and completely collapsed the "hall." A sailor was on the stage singing "Tom Bowline" and all hands were literally tangled up in the wreckage, causing for a time a small sized panic. Fortunately no one was injured. These concerts were given every Friday evening. On Wednesday nights there would be dancing, while wrestling and boxing matches were staged in the intervals. Members of the crew had a minstrel troupe with quite a fair band. On one occasion a tug-of-war was held between crews of English, Scotch, and Irishmen in which the English team was defeated by both the others. The two victors were then pitted against each other. The Scotch were the brawniest and time and again pulled their opponents to within a foot or so of the winning mark but could never get any further. After a long struggle the contest was declared a draw but later it leaked out that a chunky little "paddy" who was anchor man on his team, had made his end of the rope fast to a ring bolt in the deck. Paddy found it wise to go into hiding after his ruse was discovered.

These various diversions broke the monotony of the long voyage. With the exception of a couple of stiff blows when our passengers had to be battened under hatches (on one occasion for forty-eight hours), the weather was good. The Crozet group was sighted when we were 61 days out, the ship then averaging about 240 miles daily.

One day, when going about six knots in a heavy swell, a young Scotch emigrant disobeyed rules by going out on the jibboom guy to hang out washing. He slipped and fell overboard. As the ship's stern passed him, a life buoy was thrown overboard and it was thought that he had been able to reach it as he seemed to be a strong swimmer. The helm was ordered hard down and the ship immediately came into the wind with yards hauled back. Every Saturday since leaving Plymouth the crew had had lifeboat and fire drill, so that inside of five minutes after the unfortunate man struck the water, a boat was over the side and clear of the ship, myself and three others being her crew. We circled around for nearly two hours and picked up the poor fellow's cap and life buoy, but there was no trace of him. The weather was cold and drizzly, with a falling barometer, so the skipper finally signalled us to return, and as we pulled alongside the ship with bared heads, those on board knew the worst. Two single women, sisters of the lost man, were among our passengers and were overcome with grief. For a week or so a spell of gloom prevailed all over the ship. Our lookout man was blamed for not preventing "Scotty" from crossing the wide white-paint mark extending across the topgallant forecastle from one cathead to the other which meant that passengers might go "thus far but no farther." A watchman or lookout was always on duty forward, by day as well as by night.

Our condensing machinery worked to perfection. It was started when the fresh water supply taken aboard in England began to get short, say about 12 days from Plymouth, and was good for fifteen hundred gallons daily. It was run twice a week except when the heavy rains of the tropics furnished a supply, when the engineer blew down and cleared the boiler and coils. There was an ample supply of fresh water during the whole voyage and instead of the regulation allowance of three quarts daily per seaman, a full deck bucket of about two gallons was furnished.

While running our easting down in about 49 degrees South latitude, a sickness akin to measles broke out among the young children. One night while I was at the wheel, the doctor, the matron, and the boatswain came up on the poop deck with the bodies of four little unfortunates sewn up in canvas; they had died that day. These were weighted by the grizzled old boatswain and dropped overboard as the doctor read from the burial service the words "commit this body to the

(Continued on Page 458)

The High Speed Oil Engine

Some Notes on Design, Research and Shop Practice

By H. F. Shepherd, Diesel Engineer, Bessemer Gas Engine Company[*]

THE term "high speed" may today be applied to oil-burning engines operating at mean piston speeds up to 1500 or 1600 feet per minute, well above the traditional speed of 750 to 900.

There is, strictly speaking, no "school" of high-speed oil-engine designers as yet. Automotive engineers, having a supply of gasoline still available at a fair price, have not in any great numbers studied injection. It has consequently fallen to the lot of diesel engine designers to acquire the necessary training to build engines to operate at high speeds. The demand for these engines arises from the markets; it is not the result of promotion, and may be regarded as a healthy product of the times.

Combustion

Increasing the speed of the diesel engine has brought out nothing novel thermo-dynamically. If testing reveals anything it is only the necessity for wearing surfaces of genuine high-grade workmanship, for first-class metals properly heat-treated, and the general design practice already well established in the automotive field.

The advance of injection for high-speed is little if any greater than for slow-speed engines. The natural turbulence of the air charge seems to be stronger even at the same valve-passage air velocities. This may be so because less time has elapsed to damp it. This was a pleasant surprise and removed the fear that the time interval would be too short for combustion.

Maximum pressures tend to run higher and it is well to design for 750 pounds rather than for 600 pounds. This is true of the airplane engine as well. Old-time gasoline engines were designed to resist 400 pounds per square inch, but 750 pounds is not uncommon in the airplane engines of today.

The most conscientious efforts will be required if the life of the high-speed engine measured in revolutions is to be as great as that of the older slow-speed engine. Forces due to rotation and reciprocation increase directly as the square of the number of revolutions. It is not always practical to increase strength or surface to carry these greater loads as mass increase overcomes any advantage. In the case of the valve gears, improvements can be made in design, workmanship, and lubrication of the pin bearings; but connecting rods and pistons have already been developed as regards bearing metals and lubrication to the best of our present knowledge, so that reduction of weight is essential. If this is carried too far, life will be short, of course.

Cost per Horsepower

It is quite obvious that a high-speed engine will cost less per horsepower if, using smaller but adequate dimensions, it is constructed of the same materials as are used for heavy engines; let us say, gray iron, S.A.E. 1020 steel for case-hardened parts, and S.A.E. 1035 steel for forgings.

If extra-light weight is a further requirement, aluminum or steel castings replace gray iron for the main structure. Aluminum alloys can replace at the most three times their weight of cast iron, and usually but twice. Their cost will be not much less than 60 cents per pound. Multiplying iron foundry costs or prices by two or three will by no means offset this figure. Steel castings for bed plates are not definitely quoted but have been tentatively offered at 25 cents per pound, with reservations for future orders. Such castings have been made with sections half as thick as would be used confidently in gray iron, but their use is still not economical and the supply is as yet uncertain. Malleable iron bed plates are being made in numbers for engines of moderate size but the foundries are not yet ready to undertake anything larger. The annealing equipment is not large enough and distortion causes either too many losses or the expense of too much care to make the job a very profitable one.

Thus there are high-speed engines designed with a low-price objective and high-speed engines built for the least possible weight. Fortunately the light engine in aluminum may be built to the same design as the heavy engine, so both aims may be met with only a price difference.

Design

Regardless of what cost considerations may govern the main structure, the weights and designs of the reciprocating parts, piston and rod, are fixed by the speed, although two strings of parts, a light set for high speeds and a heavy set for more moderate speeds, may be used with the same engine design. Experience has shown that the mean terminal inertia should not exceed 100 pounds per square inch of piston area. It is true that the rods of double-acting engines are put in far greater tension, but the inertia load is a result of mass which is a measure of the shock at pressure reversal. An examination of airplane engines of all types shows that designers have reduced piston weights so much in attaining inertias below this figure that piston life is a matter of hours.

Assuming that

$$0.00034\ WrN^2 = 100$$

then for 250 revolutions per minute and 750 foot piston speed, $W=6.3$ pounds. This engine may be built with a crosshead.

For 600 revolutions per minute and 900 foot piston speed, $W=2.2$ pounds. This engine may be built with a quite substantial cast iron piston and a steel rod.

For 800 revolutions per minute and 1600 foot piston speed, $W=0.92$ pound. This engine may be built with a sturdy light metal piston and a well designed steel or duralumin rod.

For 1200 revolutions per minute and 1600 foot piston speed, $W=0.61$ pound. Here far greater skill will be required to attain the weight and at the same time provide ample strength and proper wearing surface.

Piston speed after all is not a rational measure. Piston speed times revolutions is the true measure of inertia forces. A high mean piston velocity reached by a long stroke results in far less free force than the same piston speed resulting from high revolutions. Here the designer must consider the driven machine. High generator or centrifugal pump cost or the introduction of a speed-increasing drive may put the unit off the market although the engine price is favorable.

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[*] This paper was presented at a meeting of the Metropolitan Section of the American Society of Mechanical Engineers, New York, February 25, 1927.

It is always well to design for synchronous speeds, say 600, 720, 900, and 1200 revolutions per minute, as pumps and other machinery are so designed for motor connection.

Rotating parts, although balanced, deserve special consideration; both crank pin and crank shaft bearings are split horizontally.

Stationary engine bearings are usually well relieved at the joints, and thus fitted they are not well adapted to horizontal loads. At mid-stroke, when any crank is horizontal, inertia forces are about zero and there is no gas pressure except the negative work of charging or exhausting. This leaves the box and crank almost totally under the influence of centrifugal force operating in a horizontal direction on the box joints. Fitting to a high bearing helps this condition, also grooving, but it is always advisable to reduce the force. This is done by babbitting directly into the steel rod, using as little babbitt as possible on account of its high specific gravity; or by the use of duralumin rods. The author has used, quite successfully, a conventional tubular forged steel rod with a conventional crank pin box of aluminum alloy lined with babbitt. The box is first "tinned" with aluminum solder and then with "half-and-half" solder and heated before pouring. Tinning can be done with a rotating wire brush, using tin and no flux as practiced by the Aluminum Company of America.

Cast aluminum alloy pistons are worth about one dollar per pound, and the equipment cost is high. If the other engine parts are suitable for increased speed, their use by permitting higher speed and rating in the ratio about 1.41 to 1 is economical. They are perhaps not as durable as cast iron pistons in normal use, but in case of too close fitting or overheating they are far less likely to ruin liners by scoring or to pull rods apart by piston seizure. The crown must be supported as the metal does not retain its strength above 600 degrees fahrenheit. It is also very elastic and of coarser structure than gray iron, and therefore fails by fatigue if subjected to frequent flexing at high temperature. The Butler piston with its steel bands overcomes any expansion difficulties.

Forged duralumin rods are very attractive. The high cost of dies has prevented the author from testing them until recently, and perhaps there has been some reluctance in accepting the empirical designs advanced by the makers. The modulus of elasticity of this metal is low, and constants for use in Rankine's column formula would be very welcome. Vickers has already done much of this work for the design of airship members, but nothing applicable to rods. The set in use is wonderfully attractive and seemingly unbreakable. It is used on a 500 horsepower V8 Bessemer engine.

For the same reason that the "rotating" end of the rod should be light, the crank pins should be as light as possible, particularly as two throws operate on the center bearings, but due consideration must be given to torsional stiffness. It was once considered practical to pass through one or more critical speeds in the operating range, avoiding continuous running at these speeds. Today, in rotating and reciprocating machinery, critical speeds are avoided altogether. Short shafts of large dimensions are the order of the day. Crankpins should be hollow to reduce centrifugal weight and the moment of inertia of the shaft weight. Light, stiff shafts and light reciprocating parts are most effective in raising torsional critical points. The **pv** values are raised by short bearings of large diameter, but no case has been found where any near approach to a limit has been reached. The **pv** value as a factor of engine-bearing design has lost significance with the exclusive use of forced lubrication. By the use of the babbitt metal developed by the Bureau of Standards, maximum pressures as high as 1750 pounds per square inch have been placed on the crank pins without trouble.

Thus far no crankshaft dampers have been used on Bessemer engines, and the stiffness of the shaft is proportioned from the known critical speeds of other shafts in engines of similar design.

Because of the necessity for great torsional stiffness, stresses run very low in these long shafts, so there is little use for alloy steels.

We cannot do better than to examine carefully the new Packard airplane motor shaft for an impression of ruggedness and of short, stiff bearings before proceeding from slow-speed engine shafts into the design of high-speed shafts. We must always bear in mind that to double its natural frequency the shaft must be four times as stiff.

Experiments with models show that a shaft with flying cheeks will be as stiff torsionally as a shaft with a bearing between each cylinder if the same weight of metal is used but not so for the same dimensions. Such shafts will perhaps be little used as they are not readily forged for six cylinders, although they are quite easily made for four or eight cylinders.

If the lightest possible engine is required, the hung shaft is an essential feature of the design. Two sets have been tested and the type is preferred if properly designed. Bearings are perhaps more easily fitted and replaced from above or below than in the conventional type in sizes up to about 9-inch bore.

Dual valves are necessary in designing diesel heads for high-speed engines. At 800 to 1000 feet per minute piston speed all the available space in the combustion chamber crown for single valves has been used. With dual valves there is no difficulty in allowing room for a central spray and in devising valve gears that will follow the cams up to 1200 revolutions per minute with a spring tension not exceeding 12 to 15 pounds per square inch of valve area, figures that have long been in use. The cam shaft should be elevated, but it need not be over the cylinder heads to interfere with inspection or repair. The entire profile of the cam should be designed, of course.

The valve-gear drive deserves special mention. Priority in the use of chain drive for high-speed oil engines cannot be claimed, although such drives are an almost essential feature of the type. Caution must be exercised in designing the drive and in selecting the chain. The author's practice is to lay out a torque curve for single cylinder first. This is then superimposed as many times as required for the number of cylinders served. Variations in timing among various engines and variations in cam and roller proportions and the mechanical advantage of sprockets over the cam make rules of thumb dangerous. There are in production today silent chain drives for fast engines ranging from 80 to 1500 horsepower. The author's company prefers to use a pinion and two-to-one gear at the crankshaft. Fuel pumps are driven from the gear. The chain drives valves and sprays only. The chain sprockets may then be of equal size, and the great sprocket at the cam shaft is avoided.

(Continued on Page 30, Adv. Section)

Havana Once More a Passenger Liner

Ward Line Rebuilding Old Favorite at Cost of Million at Todd Dry Docks, Inc., Seattle

By H. M. Wick*

TWENTY years ago the New York and Cuba Mail Steamship Company built a pair of fine big passenger and freight ships for their West Indies and Mexican services and named them Havana and Saratoga. William Cramp & Sons Ship and Engine Building Company of Philadelphia were the builders.

After ten years of faithful service on this run without a serious breakdown the Havana was commandeered by the United States for World War service. She was allocated to the Navy and converted into a hospital ship and did her bit for her country. After the conclusion of hostilities the Havana put into San Francisco harbor and the Navy then intended to reboiler the ship for further service. Babcock & Wilcox water-tube boilers that had been built for a battleship but never used were secured and landed on the foundations in the ship when the work was suddenly abandoned, after considerable work had been done in the way of overhauling and renewal of parts on main engines, and scaling and painting of the interior of the ship's hull and tanks.

The Navy, not having any further emergency use for the Havana as a hospital ship or for any other purpose, laid up the ship in San Francisco and several years ago sold the vessel. Early this year being in need of additional passenger ship tonnage for their West Indies services, the Atlantic Gulf and West Indies Steamship Lines bought the Havana as she was with the intention of again using her in the Ward Line service and possibly in the Mallory Line route to Texas and to Porto Rico on The Porto Rico Line, all of which are subsidiaries of the A. G. W. I.

The Havana being in a delapidated condition her new owners decided to recondition and rebuild the vessel throughout her passenger quarters and to overhaul the propelling machinery. Accordingly a contract was placed with the Todd Dry Docks, Inc., of Seattle, amounting to over $800,000, and in July she was towed to Seattle. It is expected the work will be completed in December of this year.

Theodore E. Ferris, New York naval architect and marine engineer, was called in to design a new layout of passenger quarters and to supervise the reconstruction work.

The Havana and her sister ship Saratoga are 429 feet 10 inches long over-all, 50 feet in beam, 24 feet designed load draught, and have a deadweight carrying capacity of 5092 tons. They make a sea speed of 17 knots and the propelling machinery develops 10,000 indicated horsepower.

A total of 200 first class passengers will be carried in regular and special suite rooms and in ordinary staterooms, and about 75 second class passengers in regular inside and outside staterooms. A crew of 135 will be needed. The ship is of the four deck type, with partial double bottom, orlop, lower, and main complete steel decks, hurricane deck being a partial steel deck. There are eight transverse water-tight bulkheads forming holds, 'tween deck compartments, and peak tanks, the bulkheads extending up to main deck. The two ships were originally built to American Bureau of Shipping Class, and the Havana will be rebuilt to meet the requirements of the American Bureau.

The work of ripping out the construction on the various decks has already been completed at the Todd yard and the new work is going in. In the way of public spaces there will be provided a new dining saloon seating about 122 persons at a time and finished in mahogany panel work and some paint trim; a new lounge and music room located forward on the promenade deck and finished in white with mahogany trim and having a large light and air well fitted over the center; also there will be a writing room and a library and a smoking room located aft on promenade deck finished in white oak panels; aft of the smoking

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*Associated with Theodore E. Ferris

The naval hospital ship Comfort under tow of tug Roosevelt, starting from San Francisco for Puget Sound to be transformed into passenger liner Havana.

room will be an attractively finished deck veranda and tea room painted in bright colors.

For the second class quarters there will be provided a social hall, smoking room, and dining room. At the forward end each side of the promenade deck and across the forward end will be fitted an enclosed promenade fitted with heavy plate glass windows of the Kearfott frameless type. Partition bulkheads for passageways, public spaces, staterooms, and for ceilings, will be formed with Vehisote fitted on tongue and groove backing.

The staterooms on the Havana will be furnished with Simmons metal beds and Simmons mattresses, insuring restful sleep. All of the plumbing, including 41 baths and 67 toilets, is being furnished by the J. L. Mott Company. Lifeboats, life preservers, and life rafts will be carried to take care of the maximum capacity of passengers and crew. These will be furnished by the Tregoning Boat Company of Seattle.

For fire protection the present smothering pipes and water sprinkling system will be rearranged and renewed in part for the cargo holds, and for these spaces the Rich smoke detecting system will be fitted. The Cory supervised automatic fire detecting system will be provided throughout staterooms, public spaces, and crew rooms. The present fire main water pipes will be overhauled and renewed in part. Foamite-Childs fire extinguishing system will be installed for fire room and engine room protection.

New electric generating sets of Westinghouse make are being fitted. Electrically driven winches of Lidgerwood make with Westinghouse motors are being provided new for the 'tween deck and steam winches for the weather deck hatches. A new wireless transmitting and receiving set of 2-kilowatt capacity, made by the Independent Wireless Telegraph Company, will be used. An entirely new refrigerating system for cargo and steward's cold storage is being installed as made by the Brunswick-Kroeschell Co. A mechanical ventilating system is being installed for the first and second class passenger rooms and certain of the public spaces and crew quarters.

The vessel has twin screws and there are two vertical inverted, direct-acting, 3-cylinder, triple-expansion engines developing about 10,000 indicated horsepower. New liners will be fitted in the high pressure, the intermediate pressure and low pressure cylinders, these being bored for a smaller diameter in the case of the high pressure and intermediate pressure cylinders, as the boiler working pressure is to be increased from the original 180 pounds to 205 pounds with the new Babcock & Wilcox water-tube boilers mentioned above. These eight new water-tube boilers will burn oil as fuel under forced draft and will be arranged in two fire rooms. Each boiler contains 2642 square feet of heating surface, giving a total heating surface for the eight boilers of 21,136 square feet. Each boiler will be fitted with Diamond soot blowers.

Radio

(Continued from Page 452)

wire line was used in this broadcasting; 350 engineers were stationed at broadcast transmitters and control rooms along the lines.

Radio broadcasting, since the formation of the National Broadcasting Company, has found a solution to its economic problems. The national voice of network broadcasting has warranted the greatest efforts and the highest type of professional talent before the microphones. Seekers of national good-will have not failed to appreciate the significance of this mighty voice that penetrates the four walls of six million or more homes and have been most liberal in supporting the costs of our broadcasting institution.

Hence the radio industry, starting with an annual business of two millions in 1920 prior to broadcasting, has now grown to an annual business in excess of 600,000,000 dollars, taking its place among the leading industries of the nation. Some 300,000 persons are engaged in various occupations of the radio industry. Some 42,000 radio shops are found from the Atlantic to the Pacific.

The future of radio, in its four major divisions, is bright and full of promise. Marine radio looks ahead to the day when every ship shall be equipped with the latest vacuum tube transmitter and the radio direction finder. Even the radio telephone, already installed on some ships, may become commonplace, linked up with the usual land telephone service.

Transoceanic radio looks ahead to an ever-increasing network of world-wide communication, providing direct, reliable, and low-rate service. The photoradiogram may eventually enable us to handle messages as facsimile messages, in place of our brief, terse radiograms and cablegrams.

Finally, the radio industry, having passed through the trying period of swaddling clothes and growing pains, seems well on the way to stability.

Emigrant Sailing Ship

(Continued from Page 454)

deep." The parents of the little ones created considerable commotion, claiming that each child should have had a separate service, and the doctor had some difficulty in appeasing their wrath. The malady took the lives of twelve children altogether, all under three years of age, and in the course of the whole voyage, three adults also joined the great majority. As a partial offset to this loss in our number, there were several births aboard.

Strong westerly winds lasted until we were in the longitude of Cape Leeuin, the southwestern point of Australia, after which calms and variables with much warm weather were experienced and but slow progress was made. The passengers were given to understand that no cold weather was to be expected in their new homeland and as a result practically all the overcoats on board were distributed among the crew as gifts. Myself and partner had six apiece and they were readily sold after our arrival. A couple of uneventful weeks now ensued and at daybreak one fine morning we were towed into Sydney harbor, our voyage of 117 days from Plymouth ended. After all hands were mustered and passed by the quarantine officers, the single women were at once sent ashore to the depot to await their turn for situations. There was a brisk demand for domestic servants at the time and they should not have been out of employment long. The ship then went further up the harbor and anchored at Pinchgut where she remained about a week, the rest of the passengers making their home aboard but going ashore daily to look for jobs. When all this was arranged, the Rialto was hauled alongside Grafton wharf, her cargo discharged, and the bedding, mess gear, and other equipment used by the emigrants during the voyage, sold at auction by the government agent.

The Colonial Beacon, a shallow draft, self-propelled, motor tank barge.

Colonial Beacon

Sun Shipbuilding Company Delivers Fine Shallow Draft Tanker to the Beacon Oil Company of Boston

THE Beacon Oil Company of Boston has for two years past been gradually acquiring water terminals, strategically located, along the North Atlantic Coast, and to serve these terminals from its refinery at Everett, Massachusetts, had projected a fleet of shallow-draft, self-propelled tank barges. The first of these barges was laid down at the Sun Shipbuilding Company's plant, Chester, Pennsylvania, in March, 1927, and named the Colonial Beacon. This vessel is now in service and showing excellent results.

Her principal characteristics are:

Length	253′ 6″
Beam	40′ 0″
Depth, molded	15′ 0″
Speed, loaded, knots	10
Capacity, barrels	13,000

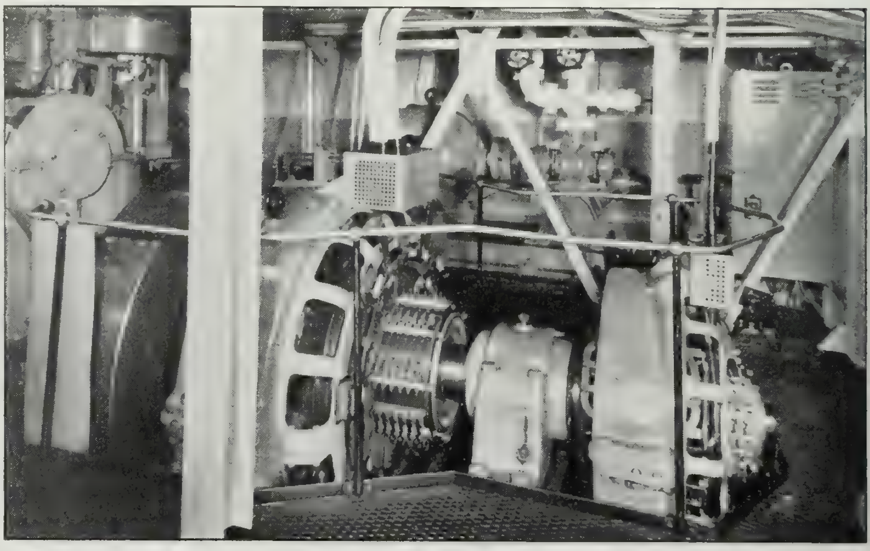
Power is supplied by two Fairbanks-Morse 6-cylinder diesel engines of 14-inch bore and 17-inch stroke, developing 360 brake horsepower each at 250 revolutions per minute and direct-connected to the propeller shafts. The vessel is of steel construction throughout. Her long low lines, enhanced by a pair of heavy longitudinal fenders, give her a very graceful appearance. She will be manned by six officers and ten men, and very comfortable quarters, comparing with modern apartments ashore, have been arranged for this force and equipped with all the latest electrical devices for comfort and health. Everything on the vessel, with the exception of the diesel engines, is electrically operated. Electrical heating, electrical cooking, electrical refrigeration, electrical ventilating, with an all-steel construction, combine to make this hull practically fireproof.

The tanker Beaconstreet, just after launching at Palmers Shipbuilding & Iron Company, Yarrow-on-Tyne, England. The Beaconstreet is a recent acquisition to the fleet of the Beacon Transport Company of Canada, Limited. She is interesting from the naval architectural standpoint as an example of the new Isherwood bracketless system of framing; 450 feet long, 92,000 barrels' capacity, equipped with Scotch boilers and triple expansion engine, giving her a speed of 11¾ knots, she was completed under the personal supervision of Sir Joseph Isherwood, Bart., to highest class special survey in 100 working days.

Latest Diesel-Electric Ferries

THE Lake Tahoe, latest of the Southern Pacific Company's diesel-electric ferryboats, and her sister ship, Redwood Empire, which is operated by the Northwestern Pacific Railroad Company, have been in service in San Francisco Bay for several weeks and have proved admirable additions to San Francisco's fast growing fleet of electrically driven ferries. These vessels, which were built by the Moore Dry Dock Company of Oakland, are electrically equipped throughout by the Westinghouse Electric and Manufacturing Company.

The principal characteristics of the new ferries, which are of steel construction, are as follows:



Close-up of one of the generating sets and its exciter on the ferry Lake Tahoe

Length over-all	256′ 0″
Length between perpendiculars	234′ 0″
Beam, molded	44′ 10″
Beam, at main deck	63′ 6″
Depth of hull	19′ 9″
Power of four unit diesel plant, normal	1800 b.h.p.
Power of driving propulsion motor, normal	1250 s.h.p.
Power of driving propulsion motor, max.	1600 s.h.p.

The prime movers of the main power plant consist of four 6-cylinder, 4-cycle Nelseco diesel engines of the solid injection type. They are of 450 brake horsepower each and are directly connected to four 275-kilowatt, 250-volt main generators and four 40-kilowatt 120-volt exciters.

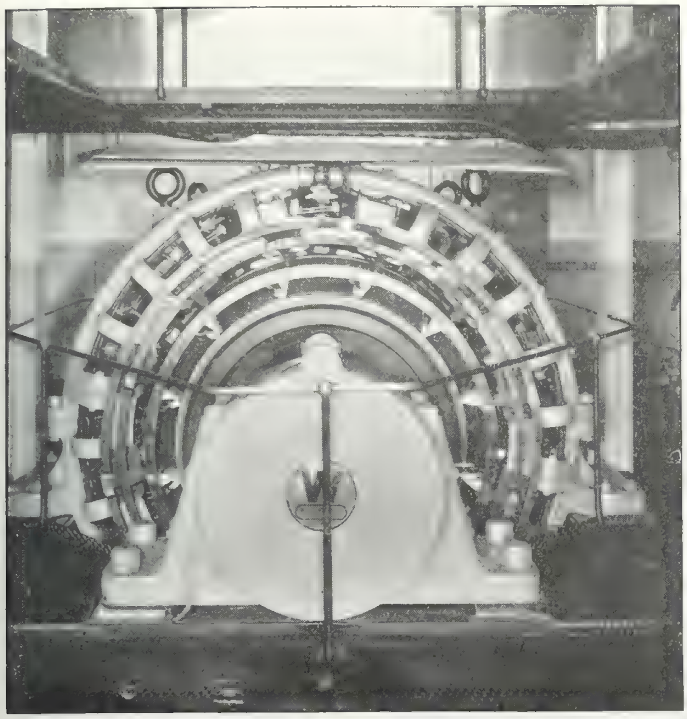
The ferries are double ended, each equipped with two 1250 shaft horsepower, 130 revolutions per minute, double armature propelling motors with the control arranged for running the bow motor at slip speed, while the driving power is supplied by the after motor.

The four main generators are connected in series and supply power at 1000 volts to the two propelling motors which are connected in parallel. The variation in speed of the two motors with respect to one another is controlled by varying their respective field strengths, rheostats being provided for the motor fields so that practically any required variation of speed ratio may be had to give the most efficient operation for different operating speeds. The parallel system of propelling motor connection used by Westinghouse on these boats has given them excellent maneuvering ability, especially desirable for ferry service, the backing power being increased by applying a high torque to both bow and stern screws during a reversal of power.

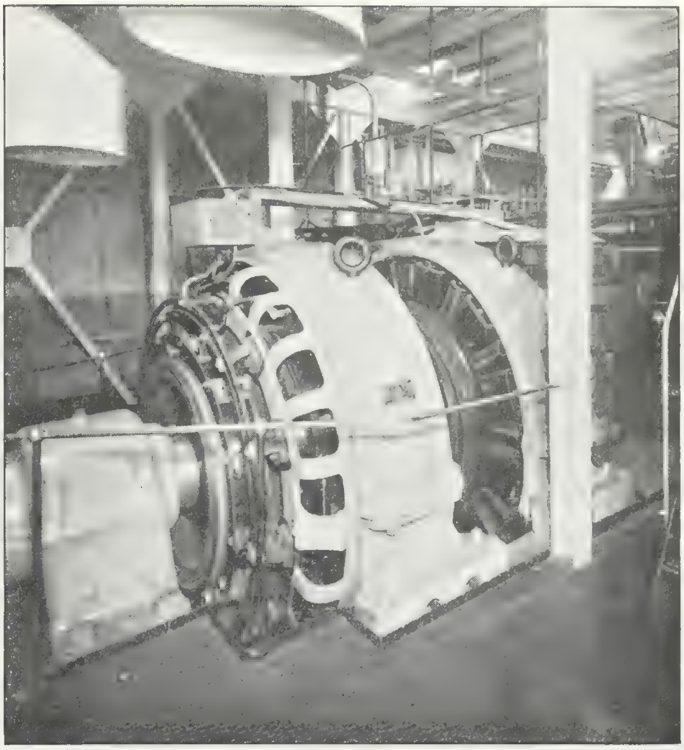
No attempt was made in the design of the electric propelling machinery to provide anything but the most rugged and reliable equipment, with ample overload capacity to utilize, if necessary, the maximum output of the prime movers.

The well known Westinghouse variable voltage system of control is used, whereby all speed control and maneuvering is accomplished by varying the separately excited shunt fields of the main generators. Three control stations are provided, one in the engine room and one in each of the two pilot houses. The main

The Northwestern Pacific diesel-electric automobile ferryboat Redwood Empire.



End view of the Westinghouse 1250 shaft horsepower, double-armature propulsion motor on the ferryboat Lake Tahoe.



Side view of one of the 1250 horsepower double-armature propulsion motors installed on the Lake Tahoe.

switchboard is of the dead front type, with one lever operated back of board mounted knife switches, the switches being mounted on a vertical sub-panel providing an installation on which the accumulation of dust and other foreign matter is reduced to a minimum.

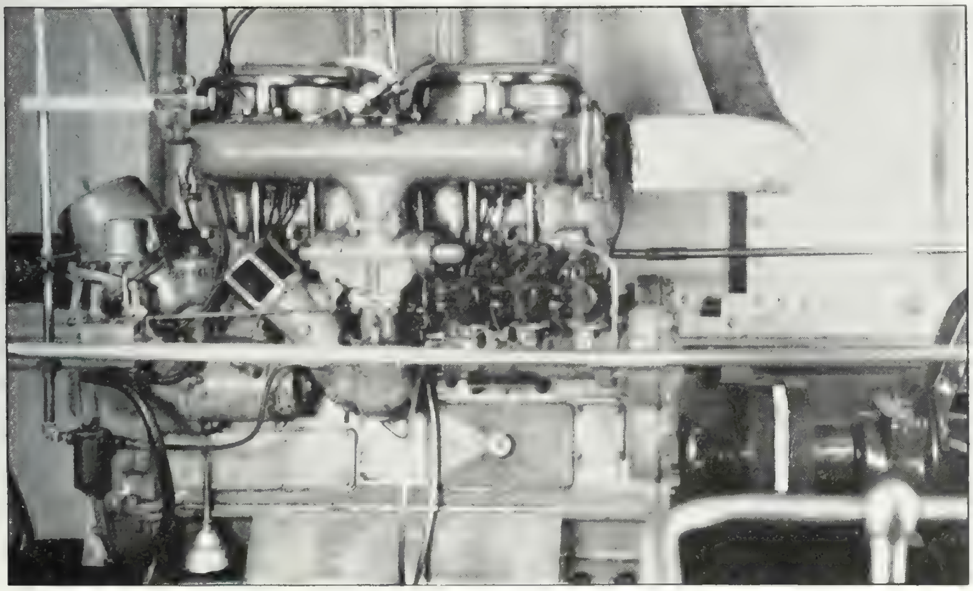
The main switching equipment is used only in case it is desired to cut in or out one of the main generators, interlocks being provided so that it will be impossible to open the main propulsion current while the plant is in operation.

The auxiliary equipment is all electrically operated, including pumps, steering gear, air compressors, etc., even to the completely electrically equipped galley. All auxiliary power while under way is supplied from the direct connected exciters. The auxiliary switchboard is of the live front type, the switching arrangement being such as to allow a distribution of the auxiliary power and excitation of the main units among the four direct-connected exciters, and at the same time does not allow the paralleling of the exciters. This system of connection removes the undesirable condition which would exist with the parallel connection where the prime movers are, as in this case of ferries, subject to sudden load variation.

The Redwood Empire, the last and fastest of six similar ships, holds the trial speed record of 13.6 knots average over the measured mile. The new boats have made a remarkable fuel saving over that of the old steam ferries, the electrical drive ships operating on approximately one-seventh the fuel of the steamers.

The diesel-electric system provides drive for this type of vessel which, from a maintenance standpoint, has never been equaled. They are operated continuously during the daytime, and some of them are on twenty-four hour schedule. The power plants are of such capacity as to allow schedule time to be made on three out of the four main generating sets, thus allowing the shutting down of one of the main diesel engines for periodic overhaul without interfering with the continuous operation of the vessel.

There are now sixteen electrically driven ferryboats operating on San Francisco Bay and the increasing interest in this type of drive is indicated by the fact that eleven of the present fleet of sixteen ferries were put into operation since February of the present year.



Sterling 4-cylinder gasoline engine driving emergency generator on Southern Pacific diesel-electric vehicular ferryboat.

Hawaii, The Yachtsman's Paradise

By Jean F. Hobbs

PERHAPS nowhere in the world do ships and shipping mean as much to the "Man in the Street" as they do at the crossroads of the Pacific. Ships and shipping of another day have left the definite imprint of a colorful and romantic past on Hawaii, visible everywhere in the seven islands that comprise the territory. Whaling ships carried the fame of Hawaiian tropic charms to distant lands, and were probably the beginning of tourist advertising. Whaling ships brought to Hawaii sturdy sailormen who laid the foundations of Uncle Sam's immensely rich and important Pacific sugar bowl. Sandalwood ships stripped Hawaii of her precious wood, it is true, but in return they provided her newly received Anglo-Saxon population with the vestments and comforts of their former mode of life. The old Hawaiians go so far as to trace their very existence on the Paradise of the Pacific to ships.

There is, in Hawaiian mythology, a flood narrative much like the Biblical account of the flood. When wickedness fell upon the world, runs this old legend, the Gods decided that the creatures of the earth must be destroyed, so the God Kane came down from his celestial abode and selected one upright man, directing him to build a great canoe and in it store provisions for his family, and enough also for members of the bird and animal kingdom that he was to take along. The Gods destroyed the creatures of the earth by a great flood, and the canoe landed safely with its cargo, on the Island of Hawaii, near Hankea, once known as the Temple of the Canoe. And so the island was again habitated.

A group of "Stars" waiting for a wind.

An Alden 18-footer.

Today one lives in the Islands consciously or unconsciously, for and by the comings and goings of ships. It is not remarkable then, that a keen and active interest is maintained in ships and shipping by the islanders. Neither is it remarkable that years of depending on ships for communication and the inheritance from seafaring forebears, have developed some remarkable leaders in Pacific commercial shipping in the Islands, together with keen interest in the sporting side of ships.

One of the most outstanding recent commercial successes of Pacific shipping, is the Honolulu agency of the Los Angeles Steamship Company, under the able leadership of the B. F. Dillingham Company. The president of this company is Harold G. Dillingham, and a ten-minute chat with him will inevitably result in talking about ships and yachts and boats. His own boats (18 footers) are his greatest hobby. Honolulu boasts one of the finest yacht clubs on the Pacific Coast, and Harold Dillingham was one of the original ten enthusiasts who started out in 1923 to bring the Pearl Harbor Yacht Club to its present position in the yachting world. These ten members have added to the membership until the club's roster now boasts sixty-five active members. The seven one design 18-foot mowers that were the pride of the original membership have been supplemented by a fleet that includes fifteen Stars, eleven one design 18-foot mowers, one Alden 18-footer, an Elco cruiser and several motor boats.

A new clubhouse was built in 1926, and its charming architecture is as famous as the hospitality that pervades the gatherings there. Truly Hawaiian in type, this building is equipped with locker rooms, showers, dressing rooms, ladies' quarters, adequate kitchen facilities, lounge, and that ideal Island institution, the Lanai, which is sim-

E. W. Borgardus in his Star.

A group of Mowers at the starting line.

ply a broad screened porch, facing the sea, where the most comfortable porch chairs imaginable intrigue the weary one to rest. A new 150-foot pier provides plenty of tie-up space, and the marine railway is large enough to accommodate five Stars and five 18-foot- s at once.

Hawaii has developed some remarkable yachting talent, as evidenced by her regular representation in the International Star Class race each year. In 1925, H. M. Dowsett and H. G. Dillingham represented Hawaii in this event, and in 1926, H. M. Dowsett, accompanied by J. Woolaway, gave a creditable account of themselves. At Narragansett Bay this September, E. V. ogardus as skipper and Bob Purvis as crew will manage Hawaii's entry.

In addition to the regular scheduled races for Stars and 18-footers, special races are held during the year. There is the Team race held in February, the opening of the season, and the Team race held in September, the closing of the season; both for the 18-foot mower class. In June there is the Hayward Cup race for this class and later in September, following the Closing Season Team race, comes Regatta Day, when many a friendly rivalry is settled for the season. The Star class also has its special races, beginning in February with a team race. In June, there is the H. M. Dowsett Cup race, while June 4 is the day of the Ocean race. The courses set out are from 10 to 14 miles, with plenty of windward work, and some creditable records are represented in the seasonal championships for the two classes. In the 18-footer season championships of 1924, 1925, and 1926, Harold G. Dillingham, E. Bogardus (chairman of this year's race committee), and Albert Afong carried off the cups for the year, in the order named. For the Carter Cup, in the same class, Dowsett earned the right to inscribe his name upon the shining silver surface of the cup for the year 1924, while Harold Dillingham won the honors for 1925 and 1926. The season championships in the Star class went to Albert Waterhouse in 1925, and H. M. Dowsett in 1926.

The club has been fortunate in the selection of its Commodores, and its race committees. In 1924, H. M. Dowsett served as Commodore; in 1925, R. W. Altkins filled the office with great credit, while H. G. Dillingham took the reins in 1926, to be followed by Albert Afong, the present holder of the office.

Fuel For Marine Gas Engines

An exhaustive series of experiments conducted by the Martinez refinery of the Shell Company of California has demonstrated conclusively that there is no additional power to be gained by using heavier distillates, according to R. J. Kramer of the Shell laboratories.

"It was thought until recently," explained Kramer, "that the heavier distillates which give so much trouble in the motor were a factor in increasing mileage because of their possessing more heat units, but our experiments, confirming those of Dr. George G. Brown of the University of Michigan and other authorities, prove beyond question that this is not the case. The reason is doubtless to be found in the fact that heavier gasolines contain less hydrogen and have a lower heating value per pound; it being well known, for instance, that gasoline has a higher heating value than fuel oil on the pound basis.

"We have, in fact, succeeded in adding materially to mileage by using, in a 400-end-point fuel, nothing but the cream of the crude; that is, the lighter fractions. This has permitted the production of a dry gasoline that vaporizes completely and gains mileage by utilizing power which was formerly wasted in the form of unevaporated particles of sluggish distillate.

"The employment of this costlier gasoline does not constitute an economic waste, as we are able to use those fractions no longer considered suitable for our new gasoline to improve our other products."

Sunset over the rice fields near the Pearl Harbor Yacht Club, Honolulu.

In the Engine Room

A Department Devoted to Marine Engineering from the Standpoint of the Operating Platform

Practical Chats with the Engineer

That Damned Governor

THE usual type of governor as installed on the marine type reciprocating engines is a unit often regarded with contempt by operating engineers and will often be found shelved in the store room instead of attached in its usual place on the engine. If attached, it will be often found out of adjustment or otherwise sadly neglected. It would seem that this same degree of contempt is shared, too, by many engine builders, who utterly ignore the governor in their shop specifications, for it is sadly true that there are a great number of marine reciprocating plants not governor equipped.

I have had engineers tell me how useless these little sentinels are while engines are racing in a seaway, and I have heard repeatedly that there is no antidote quite so effective as the human element when it comes to regulating receiver pressures at such times. They have told me that the human element can check this tendency to race many seconds before the governor has awakened to the fact that the racing had actually begun. This condition is often true, but chiefly because the engineers themselves were either indifferent or did not understand the governor and its adjustments. I know from long experience, that a governor carefully adjusted will catch the engine on its first wild stroke.

From my personal viewpoint, however, a governor is a blessing, and while I do not care a hoot for the degree of its psychic ability to anticipate a propeller's elevation into the less dense surface water, the mere fact that the governor is on the job gives me a feeling of confidence that I never enjoy with an engine ungoverned. It is a device upon which I pin great faith and security, in fact, just as much as I do the safety valves on my boilers, for I place the engine governor in the same category, for whether in a furious seaway or a glass surfaced bay, Old Mr. Governor is a faithful friend if you treat him right. It is not difficult for me to picture the result of a tail shaft snapping, for I still carry a mental photograph of one that did, and let me assure you, that an engine under full headway, suddenly freed of its tremendous torsion, is a thing not easily forgotten. One with but little imagination, can hear the loud report of a snapping shaft, followed by the metallic roar of a released engine, accentuated perhaps by the carrying away of steam lines, dealing out death to all below. If the human element is **then** near the throttle, God be praised.

Happily, shafts do not often break, and to anticipate such an unusual occurrence may seem superfluous. Yet we reflect that boiler explosions too, are rare, and we find boilers are carefully governed against undue stresses by safety valves. Yet I doubt that any bursting boiler would create greater havoc than an engine under full power suddenly released and with no one nearby to save it from absolute destruction.

However, the governor will do the trick, if it is given the care that it deserves, and I maintain that by this virtue alone, it is justly entitled to the respect of every engineer and the right to full and staunch support by both the underwriters and the federal inspection service.

Put These in Your Pipe

If there are any stop valves to be closed or opened, attend to it personally. Remember that when you do it yourself, **you** will know that it **is** done. Unlicensed men often err, and you have no recourse.

* * *

A trip through the engine room bilges on sailing day is not exactly a pleasure, but it is often a revelation, especially if bilge cleaners or painters have been at work, and you know what it means to have stray rags or waste floundering about bilge line rose boxes at sea.

* * *

Paint is pretty and sometimes often covers a multitude of rust, but it far too often covers valve stem threads, gland studs, and last but not least, name plates. In obtaining the builder's recorded physical data of a pump or dynamo, it is far nicer to read it from a legible builder's plate than to resort to a scraper and work down through six layers of paint endeavoring to find that plate.

* * *

Valve wheel wrenches are mighty handy tools, and it denotes far better engineering practice to use them in lieu of the much abused monkey wrench. But why use either? Valve designers know their stuff, and they design their hand wheels with sufficient leverage to properly and effectively actuate their valves. Why not, therefore, have the valves and their stems in such shape that the hand wheels will do what their designers intended?

* * *

Indicator cards are brief but concise photographs of the engine's physical characteristics. Don't worry so much about figuring the M. E. P. for that seldom varies to an alarming degree. The characteristics of the little picture when properly interpreted are of greater importance.

* * *

All engineers hope some day to be marine superintendents, for it is true that an engineer makes a good one. It is really not difficult to make a darn good port captain out of an engineer, but it is a heck of a job to reverse that process and make a darn good port engineer out of a captain. So go right ahead and study the duties of the deck, strandings, groundings, collision cases, and damaged cargo surveys. But don't be premature. When your vessel runs aground on a coral reef or a sandy strand, don't run up to the "old man" with your pet version of first aid in stranding cases. He may resent it, and besides, you had best wait until you **are** marine superintendent.

WE ALL MAKE MISTAKES, BUT

The little rubber tip crowning a lead pencil and known as an eraser was a simple invention and made millions for its inventor, and is truly a most convenient device, but a pencil thusly equipped should be barred from the log desk. All of us make mistakes, hence the rubber and its popularity; but a mistake made in a log entry should never be erased, but should have a line drawn through it, and the corrected entry made close by.

The rough log should be held sacred, for it is an authentic and official record, and erasures or apparent attempts to deface or destroy, or make illegible what has once been entered are looked upon by courts as efforts to conceal the truth and may defeat what otherwise might have been a well defined case in favor of the ship or yourself.

One more little thing. Never permit an entry to be tampered with over your signature. Your entries must be corrected by yourself alone.

able material to lead this air away from the motor and you will be surprised at the improvement in power and the cool smoothness of operation.

Make a friend of "Sparks." Your radio operator may be an expert trouble shooter for electric machinery.

When in port cultivate the marine installation experts of the big electrical companies. They can spill a lot of useful information if you get them warmed up.

Read this department in Pacific Marine Review and send us your problems. We will see that they are solved for you by the best available experts.

Some A-B-C's on Electric Motors

EECTRIC motors are being used for many purposes aboard ship these days, and the engineering personnel aboard is usually held responsible for their proper functioning. The direct current, low voltage motor is a very reliable piece of machinery. If properly installed, not overworked, and kept clean, it usually gives no trouble.

Motors on shipboard are usually enclosed or semi-enclosed. Sometimes, and particularly in the engine room, they are installed under conditions far from ideal. One often finds motors on engine room pumps in a dark corner up against a rather warm bulkhead, subject to action of salt vapor or drip from a leaky joint, or fairly well covered with grease. Under such conditions motors will usually run hot, wear out more brushes than necessary, and sometimes even go on strike.

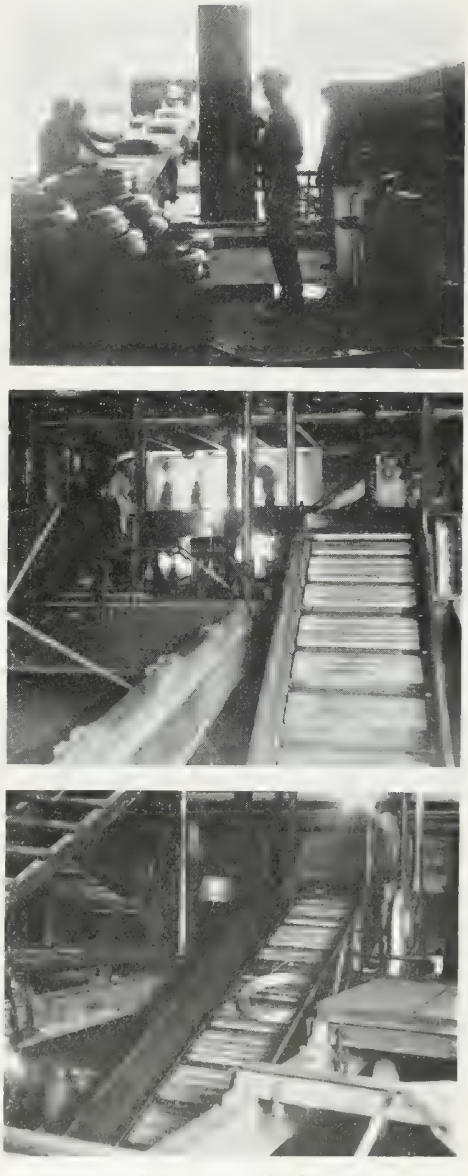
An enclosed or semi-enclosed motor is usually designed to be self-ventilating. The armature spider and windings are arranged in such fashion that their revolution draws a current of air through the armature and the field coils. For this reason it is very important that the riser leads from commutation to armature coil be kept clean as the air circulating through armature must pass through the spaces between these leads. Clean these spaces regularly at each inspection.

Brushes and commutator surface are the only points of electrical wear on a smooth running motor or dynamo. Brushes and brush springs should be inspected regularly and kept clean. Clean all carbon dust from commutator and from inside motor casing. Do not use grease on commutator. If you find that the commutator shows high spots on the mica insulation, take out the armature, set it up in the lathe, and, with a tool properly ground for soft copper, take thin cuts off the commutator face until it runs perfectly true and smooth.

When ordering new brushes be sure to specify the type, size and quality recommended by the manufacturers of the motor. If in doubt as to this, take the first opportunity to learn from the manufacturer's representative just what brush is recommended. Nearly all brushes are carbon, but there is a vast difference in the qualities of carbon brushes, and there is always one quality, type, and size best adapted for any given motor. This point cannot be too strongly emphasized.

The loss of time, temper, morale, and fuel at sea on one round trip with badly fitted, ill adapted, cheap carbon brushes may easily amount to more than the additional total cost of the best brushes for the entire fleet for all time. Cut this out and discuss it with the purchasing agent or the "super."

If after you have checked brushes and cleaned the motor, it still runs hot, check up on the air currents. It may be your motor is so placed that the warm air from the motor case is recirculating through the motor on account of its location or in connection with structural details of the ship's hull. Should this be so, arrange baffles or build ducts of sheet metal or any available material to lead this air away from the motor and you will be surprised at the improvement in power and the cool smoothness of operation.



An electrically operated built-in cargo conveyor. This is another type of motor drive for which the chief engineer on many combined freight and passenger steamers will soon be responsible.

Liner Wear on Diesel Engines

A Practical Discussion of a Very Timely Motorship Engine Room Topic

By C. G. A. Rosen

RECENTLY, much discussion has taken place relative to the subject of diesel engine liner wear. Unfortunately, in many instances, the matter of liner wear has been overly-emphasized when considering the use of the diesel engine.

Liner wear exists within the cylinder of a diesel engine just as surely as bearing wear exists in any shaft journal. Wherever surfaces rub over one another, wear is bound to occur. Cases have been known where liner wear has been abnormal, but these instances should not be considered stumbling blocks to the progress of the diesel engine. Undoubtedly, these cases will be considerably reduced as developments and advances are made. The engine room crew can be of much assistance in cooperating with the manufacturers to minimize the possibilities of excessive liner wear. Any progressive engineer should be greatly interested in investigating the various phases contributory to liner wear.

Liner wear involves a number of problems requiring the need of careful study and close analysis of many items. The causes affecting liner wear may be said to involve the influence of heat, pressure, and speed on:

1. Lubrication.
2. Metals.
3. Design.

These factors are also related to the quality of fuel oil employed.

At first glance, it would seem that lubrication is a matter of first importance. Theoretically speaking, as long as piston rings ride on an unbroken film of proper lubricant, no wear can take place on the liner. In practice, however, the unbroken film and proper lubricant are sometimes difficult to maintain. This is particularly true in the case of large cylinder diameters.

If it be possible to deliver and distribute the proper lubricant to form the necessary "oil film" beneath the traveling piston rings and to maintain this film throughout the operating cycle, liner wear would be at a minimum. In reality, the problem boils down to a proper balance between adhesion and cohesion of the lubricating oil film.

The oil film must have sufficient adhesion to stick to the cylinder walls under the conditions prevalent on the liner surface and still have sufficient cohesion to maintain an unbroken film and hold a "body" against the pressure of the rings at the existing temperatures. By adhesion we would then mean that property of the lubricating oil which would tend to make it stick or hang on to the cylinder walls and resist the action of the rings, which tend toward wiping off the film from the lined surface. By cohesion we would understand the property of the lubricating oil which would resist the action of pressure tending toward isolating the oil film into segregated islands of lubrication.

Figure 1 illustrates, in a diagrammatic way, an analogous set of conditions prevalent within the engine cylinder. These data represent information gathered from numerous tests and are arranged for illustrative purposes. The cylinder is of a size capable of developing 350 brake horsepower when operating under the 2-cycle principle. In this particular case, the lubricating oil is introduced through the liner walls near the bottom of the stroke of the piston. The lubricant is injected through nozzles against the rings of the piston as they move downward. The completion of the discharge is obtained when the bridge between the second and third rings passes the nozzle orifices. These nozzles are placed on the periphery of the liner at six points, thus assisting in the equal distribution of the lubricant. On the subsequent upstroke, the rings carry the lubricant upward and deposit it on the wall of the liner. The lubricating oil film thickness is diagrammatically illustrated in Figure 2. The cross section of the oil film in this diagram assumes a wedge shape, and the minimum thickness of the film is nearest the top of the liner.

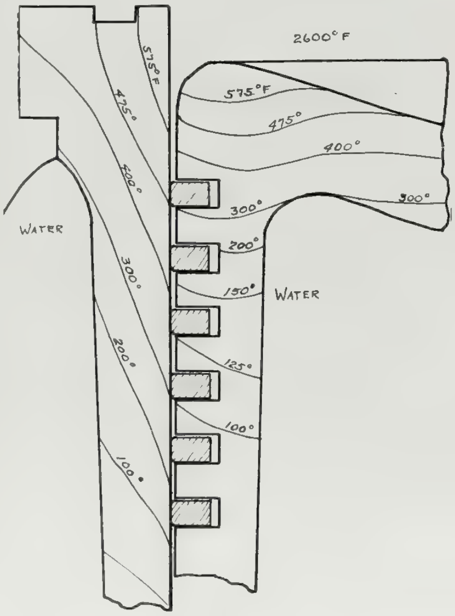


Fig. 1.

The combustion process within the cylinder develops a gas temperature of approximately 2600 degrees Fahrenheit and a pressure of about 520 pounds. About 80 per cent. of the heat developed is absorbed by the cylinder head and the water-cooled piston. The remaining heat passes out through the liner walls. The mean temperature curves in the piston and liner are shown in Figure 1. These curves are drawn to indicate the conditions in the upper regions of the cylinder, where the liner wear is greatest. The pressures existing between the piston and liner wall are indicated in Figure 3. For approximately 10 per cent. of the power stroke, a maximum pressure of about 520 pounds per square inch is developed within the combustion space. This gas pressure must be prevented from entering the crank case or engine room from below the rings. The piston rings must then act as a labyrinth packing to gradually dissipate the pressure until practically no pressure exists at the bottom ring. Part of the lubricating oil passes around the clearance space between the ring groove and the piston ring and assists in forming a seal to retard the flow of gas.

Figure 3 shows the pressures as they are believed to exist between and behind the rings. It would naturally be desirable to keep the pressure of the gas at a minimum behind the piston rings. Any gas which might be trapped behind the rings tends toward forcing the rings against the liner wall. Excessive pressures behind the rings would tend toward breaking down the lubricating oil film and causing the rings to ride on a dry liner area.

At the wall temperatures indicated in Figure 1, the thin lubricating oil film near the top of the cylinder would have a tendency to be reduced in viscosity. This reduction in viscosity lowers the ability of the oil to hold its body. When pressure is exercised behind the rings, the thinned-out oil film has a tendency to break down and thus expose liner surface to the rubbing action of the rings at almost metal to metal contact. When this action takes place wear naturally results.

The problem of lubrication resolves itself down to the introduction and distribution of a lubricating film which will properly coat the liner wall under operating conditions. To render this condition possible, other factors must also be considered. The metal employed in the manufacture of the liner should be such that it will have strength in resisting the pressure and temperature stresses, that it will be sufficiently thin to reduce the temperature gradient, sufficiently hard to minimize wear and also embody a property which will assist in causing lubricating oil to adhere to its surface. This last property is not as yet fully understood. What is it about a metal that causes a lubricant to adhere to its surface? Is it a matter of porosity or is it a question of attraction of molecules of oil to molecules of metal? Cast steel makes a very poor cylinder liner because lubricating oil will not adhere to its surface. Lubricating oil will have a stronger tendency to cohere and draw itself into segregated islands on the liner surface in the case of cast steel. In some instances a relatively coarse iron has been known to resist wear and in other cases a very fine silk-like surface has been known to give long life in service. Recently, alloys such as chrome and nickel (Mayari Iron) have been employed successfully to refine the crystalline structure of the metal so that a bright glazed wearing surface resulted. The recent German development of Perlite iron has made strides in reducing liner wear.

The material for pistons should also be carefully selected. In large engines the ring grooves should have close access to the water spaces so that the ring temperatures can be held down to a minimum. The ring grooves also should provide good wearing surface for the sides of the piston rings. Very often a cast iron piston will develop porosity in the ring grooves. This porosity generally indicates soft iron which wears rapidly. When the ring grooves wear rapidly, the clearance between the ring and groove becomes excessive and high pressures are developed behind the ring and considerable leakage takes place down to the bottom ring. Any efforts made toward maintaining a fixed clearance between the rings and grooves materially assist in reducing liner wear. Some manufacturers have resorted to the use of forged steel pistons and in some cases have even carbonized-hardened the ring groove surfaces so that the ring groove wear is lessened. The wisdom of this action has been proved out in practice by reduced liner wear.

Piston rings should have ample wearing surface on the sides. If a piston ring is shallow, it will wear fast and will cause the ring groove to wear fast. By providing ample wearing surface, lubrication of the ring sides can be more effectively maintained, resulting in good ring seal. Piston rings should also bear on the walls of the cylinder with a uniform pressure all around the periphery. Rings are very often hammered so that this uniform spring tension is developed in the ring itself.

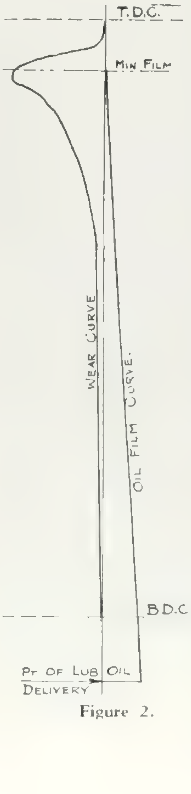


Figure 2.

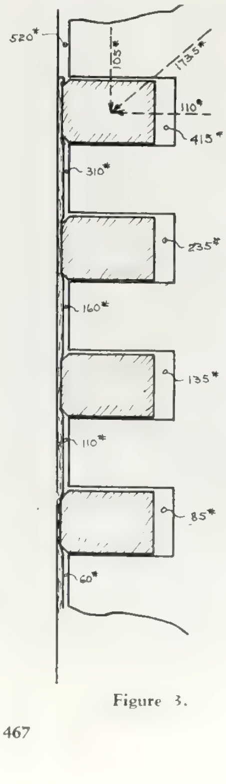


Figure 3.

The design of the piston should be such that no uneven heat distribution will cause protruding surfaces. Any protrusion on the piston will naturally thin out the oil film and may cause film rupture. Carefully controlled piston cooling temperatures naturally prevent undue heating of the piston and minimize opportunities for strained sections.

Fuel oil also influences liner wear. The effect of impure fuel oil on a lubricating oil film naturally tends toward destroying lubricating value. Fuel oils very often carry as much as a pound of sand for every twelve barrels of fuel oil. If this sand is introduced continuously through the fuel valve, the major portion of it will be deposited on the lubricating oil surface. Part of it will be deposited between the rings and the ring grooves, and some will also adhere to the bridges between the rings. The effect of fuel oil impurities would tend toward destroying the lubricating oil film and cause liner wear. In some cases carbon attached to the bridge between the second and third rings has contained as much as 15 per cent. sand. This reveals the ability of the sand to travel down the surface of the piston and cause the piston to act as a lapping tool on the surface of the liner. The solution of this problem is very simply obtained by the use of the centrifugal oil purifier to remove the foreign matter from the fuel oil.

In conclusion it may be said that further study would be profitable regarding distribution of lubricating oil over the liner walls. The liner wear curves exaggerated in Figure 2 illustrate that the maximum wear occurs at the thinnest oil film. The thinnest section of the oil film exists at the points of highest temperatures of the liner walls and at positions of highest pressure behind the rings. Any efforts made to develop a sufficient oil film where it is most needed will reduce liner wear. It may even be necessary in future large engines to introduce the lubricating oil through the piston by a timed-pressure device so that the oil film may be developed near the top of the stroke where it is most needed.

Pacific Workboats and Their Power Plants

British Columbia Workboats

The typical Puget Sound seiner, East Bay No. 2, built by Hoffar-Beeching Shipyards, Ltd., Vancouver, British Columbia; 160-horsepower Hall-Scott geared gas engine.

THE City of Vancouver, terminal of the Canadian Pacific transcontinental railways, is situated on the shores of Burrard Inlet. Its location is ideal for shipping, deep water coming well into the inlet, with a perfectly sheltered harbor. Its overseas trade is large, both in imports and exports.

The numberless smalled bays and inlets along the Coast, and across the Gulf of Georgia, also tend to an extensive employment of vessels of the workboat class. Many shipbuilding establishments, devoted almost entirely to the building and repairs and maintenance of fishing vessel and towboat work, are located here. Fishing is of considerable importance, vast quantities of deep sea hand line and seined fish being brought into Vancouver for shipment east and for local consumption. Besides this fresh fish, tremendous amounts of canned and cured fish are brought into and shipped from Vancouver.

The towing of large barges laden with coal, sand, and rock is another industry of importance to the workboat operator, as is the towing of log rafts, millions of feet of cut timber being gathered from the camps along the shores of inlet and river and brought to the big mills near Vancouver, where they are made into various sorts of lumber and products. In all this business the busy little workboats play an important part. Some twenty large firms operate these craft.

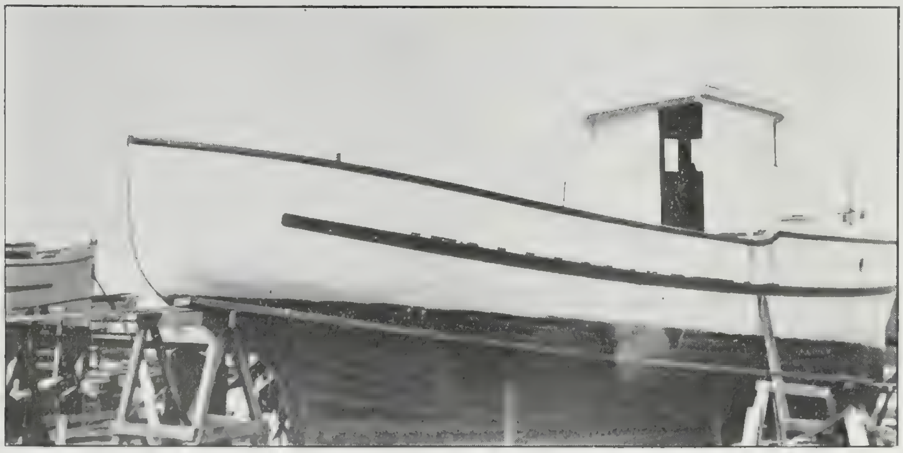
* * *

The **Pacific (Coyle) Navigation Co.** keeps a fleet of thirty-one tugs and sixty barges busy and is one of the largest operators in the Northwest. **G. H. & A. S. French, Ltd.**, are also workboat operators, their fleet being now almost entirely diesel powered. Formerly this firm owned the three largest and most powerful steam tugs in the Northwest, but have sold them to other firms operating farther north, away, as yet, from bases of supplies where fuel oil can be always obtained.

* * *

Among the firms which specialize in the building and repairing of smaller craft, the **Hoffar-Beeching Shipyards, Ltd.**, occupies a prominent position. During the past season it has turned out several boats for seining and towing work. This company also fabricated the wooden ferryboat Kelowna-Westbank, which it assembled far up in the mountains on the banks of the Frazer River. This vessel is 95 feet length by 17 feet beam and is fitted with a Fairbanks-Morse 125-horsepower CO engine. The Hoffar-Beeching Shipyards also builds a stock speedboat of extra fine construction. These swift vessels are 23 feet length by 6½ feet beam, of mahogany, with all fittings highly finished. For their propulsion they have a 125-horsepower Scripps gas engine, giving them a sustained speed of 30 miles per hour. An interesting pair of products from the Hoffar-Beeching Shipyards, are the East Bay Nos. 1 and 2, seinboats, with a length of 60 feet, beam of 15 feet, and powered with Hall-Scott R-6, 3 to 1 reduction geared engines of 100 horsepower, giving them a speed of ten knots. The heavy build of these sturdy boats enables them to keep the sea in any weather.

The Hoffar-Beeching establishment is fitted with all necessary tools, both metal and woodworking, to enable them to turn out work of the highest class. One branch of their establishment has done considerable aeroplane construction, and at the time of Pacific Marine Review's representative's



A 40-foot troller, built by S. E. Sagstad, Seattle, and powered with a 40-horsepower Standard gas engine.

The steam tug Barrard Chief of Victoria and Vancouver.

visit, a specially designed wing was being built for Major C. O. Osborne's Fokker plane in which he was planning to attempt a flight from Vancouver to Honolulu.

The firm is distributor for the Hall-Scott marine engines and reports good business with them, seventeen sets having been installed the past season.

* * *

Vancouver Shipyards, Ltd., is an old established firm engaged for many years in the building and repair of tugs, seiners, and workboats. They recently built two seiners, one a 75-footer, fitted with a Vicker-Petters 200-horsepower diesel engine; the other a fishing vessel of 60 feet length which has an Atlas-Imperial diesel engine of 50 horsepower. Both these craft have given good accounts of themselves since going into service. The repair ways of the firm have been very busy during the past season, several new jobs being refused on account of this condition.

* * *

Crane's Shipyard, Ltd., Vancouver, is a long established yard that has very recently entirely rebuilt its shops and offices. Modern and complete machinery has been installed and the plant is now ready to handle any class of work. The past season five trolling boats were built, and the 120-foot ways have been busy on repair work.

* * *

A. Linton & Co., Ltd., Vancouver, specializes in the building of yawls and power seiners, the latter of the 45 and 55-foot type. Union diesel engines are installed in many of the boats built by this firm, which besides new work, handles a large amount of marine repair jobs of all classes. Johnson & MacDonald, both practical ship and boatbuilders, are the active partners in the business, A. Linton, the founder, making his home in California for the most part.

Hoffar, Ltd., Vancouver, builds no vessels, but handles power and specialty plants for small craft. This firm is distributor for the Sterling and Kermath gas engines and reports good business. Two Dolphin-Sterlings of 90-horsepower each have been installed in a 45 by 10 foot express cruiser lately, and have won high praise from the owners. This firm handles Johnson outboard motors also, and a large stock of parts and spares is kept ready for service. During the past season Hoffar, Ltd., has sold ten sets of 90-horsepower Sterlings which were installed in seiners operating out of Vancouver.

* * *

The Georgia Engineering Co., Ltd., Vancouver, is a branch of a big uptown shop. It has recently built a well-fitted machine shop and will engage in the marine repair and supply business. Mr. Dawes, manager, is a practical diesel and gas engine man and has associated with him a corps of good mechanics, who can handle work of any size and class.

* * *

The Burrard Drydock and Shipyard, Ltd., West Vancouver, managed by Charles Leslie, operates a large marine railway and engages principally in repair work for workboats, scows, and dredgers. Well equipped shop and store rooms insure prompt service, and the complement of ship and engine workers in metals and wood can turn out good work in short order. Business is reported very good the past season.

* * *

W. R. Menchions, Vancouver, is among the oldest builders in the business of small boat building in the Northwest. He has launched four seiners during the past season, besides numerous repair jobs, and in addition, has just delivered the Nora-Jane, a combined tug and cruiser, which will be employed as a workboat and party pleasure craft. She is 75 feet by 17 feet by 9 feet depth, and is propelled by a Fairbanks-Morse 120-horsepower full diesel engine. On her initial trip to Seattle and other Sound ports the Nora-Jane did very well in the matter of speed and seagoing qualities.

* * *

Ferrier & Lucas, Ltd., Vancouver, are engineers and designers, specializing in workboats and seiners, though they have laid out several very fine cruisers. They are agents for Atlas-Imperial diesel engines, and have a beautiful 65-horsepower sample of this motor under running conditions at their warerooms. They have sold twenty-two sets of these engines the past season and are prepared to give expert service and to supply spare parts and equipment from stock. Inquiries for future business are brisk and the outlook good.

The Retriever, a complete Puget Sound floating cannery, powered with a 75-horsepower Atlas-Imperial diesel engine and operated by the Red Salmon Packers' Association.

Chappell Brothers, Vancouver, are a close corporation controlled by two brothers. They build and repair seine and workboats, paying special attention to this class of craft. During the past season they built one 60-footer, with a 90-horsepower Bolinder engine, and a 52-foot seiner with a 60-horsepower Fairbanks-Morse CO engine. They also build a standard seiner of 52 feet, with a Hicks gas engine of 45-horsepower. They have turned out five of this type the past season. They have also sold eleven sets of the Hicks engines which have been installed in new jobs built at other yards. Their repair work, however, has run to around a hundred thousand dollars, keeping the yard and men busy.

* * *

The Marine Transit, Ltd., West Vancouver, operates a fleet of fast motor cruisers and launches for use of commuters between the many little settlements and private residences on the Inlet. There are hundreds of these places, which can be conveniently and quickly reached by water from Vancouver. A twenty-four hour service is maintained, and does a good business, several extra fast craft being on duty at all times. The firm, of which H. M. Mathers is manager and secretary, has the agency for Continental-Van Blerk engines. During the past season they have sold eleven sets, all 100-horsepower, with 3 to 1 reduction gears. Three units have been installed in workboats of the tug type, one in an oil delivery tanker, and one in a fish cannery tender. All have given good satisfaction.

* * *

Captain William Hallgren of the Vancouver Island Tug and Barge Co., Ltd.

Haskell & Willis, Ltd., Vancouver, are managing directors of several workboats and fish product companies. They also conduct a brokerage business, handling small craft, with an annual volume of business around a hundred thousand dollars. They are also the agents for the Swedish outboard motor Archemides, and the heavy duty marine diesel engine Avance, built by the same company in Stockholm, Sweden. Haskell & Willis also are distributors for the Doman Bull Dog marine engine, built in Oshkosh, Wisconsin. This unit is small but highly efficient and is claimed superior to anything of its class manufactured. As they are built only in 5 and 10 horsepower sizes, the advantages of standardization are evident. Messrs. Haskell and Willis are both young men and being practical engineers and shipbuilders will no doubt attract considerable business from the maritime interests of the Northwest.

* * *

The Vancouver-Courtnay Transportation Co., Ltd., Vancouver, workboat and barge operators in the waters of Burrard Inlet, are confining themselves exclusively to their line of freight transportation between the big city and Courtnay. They handle many thousands of tons of merchandise annually, keeping three workboats and six barges employed at this business.

* * *

The Vancouver Drydock & Salvage Co., Ltd., foot of Rogers street, North Vancouver, has a very fine location, handy to rail and water. This establishment, which is managed by E. F. Cribb, is a comparatively new venture but has done an extensive business in the construction of small tugs, seiners, and workboats. The company operates a modern floating dock and is now putting in a marine railway so that the smaller workboats and yachts may be handled while the larger floating dock is busy. A modern machine and electric shop is a part of the equipment, with a spacious woodworking and loft building handy. The company has a spacious area along the waterfront which is being levelled and improved so as to be ready for such additions as increased work may demand.

The yard has lately built a salvage boat for its own use, in which a Fairbanks-Morse 150 horsepower full diesel engine has been installed, together with all necessary pumps, lifting gear, electrical and acetylene apparatus. A racing yacht, the Lady Pat, built last winter by the yard, has proved a fast sailer. This yard has also delivered an experimental speed boat, the Kennet, 38 feet by 8 feet beam, equipped with a 150-horsepower Sterling engine, which made a good 20-mile speed on her trials. Workboat and tug repairs keep the yard busy, a force of forty men being employed on the average.

The seiner Klemtu Cannery of Vancouver, British Columbia. The Klemtu is powered with a Fairbanks-Morse full diesel engine.

Workboats at New Westminster

NEW WESTMINSTER, British Columbia, known as "The Royal City," lies on the north bank of the Frazer River, about ten miles from the Bay of Georgia. Its water frontage extends for many miles, and at this point the banks are high and rocky in many places preventing any noticeable erosion by the river. Just below the town proper is a semi-delta formation named Lulu Island. This place has for many years been the base for ship and boatbuilding of the district. During the late World War quite a number of steel and wooden steamers were built there.

The yards of Lulu Island have a reputation for turning out exceptionally strong and sturdy workboats, many hundreds of these craft having originated in this district and received their first bath in the fresh waters of the Frazer River. This fresh water, too, makes dry-docking there attractive to owners and masters of ships, for the clear snow water is a very effective marine growth remover. Piling, too, stands up much better there than where salt water laps the wharves. In many other respects Lulu Island, New Westmintser, makes an ideal shipbuilding base, its principal claim being the closeness of the big forests of Douglas fir lining the banks of the river, the timbers being very easily floated to the yards.

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One of the oldest yards is the **Star Boatyard Company,** owned and operated by Edward Mercer, who founded it some forty years ago. His sons, Arthur and Gordon, have learned the shipbuilding art from their father and have now taken active control of the splendid business built up by the elder Mercer, himself a shipbuilder of parts from the Eastern Provinces. At this yard have been turned out several well known craft, among them the big snag vessel Samson III, operated by the Canadian government in its aid to navigation work on the Frazer River and at Vancouver harbor. A 60-footer, a 40-footer, and a 36-footer, powered by Thornycroft 3 to 1 reduction geared gas engines, for the Cassiair Packing Company, together with a heavy run of repair work, has kept the yard busy during the year. A new woodworking shop fitted with latest designed machinery has recently been built, and it is the intention to soon erect a well equipped machine shop, as prospects are bright in smaller craft building.

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Another notable yard is the **Dawe Shipyards, Ltd.,** also on Lulu Island. This establishment has been in operation for many years, and during the late war turned out many steam vessels of 256 feet length for the Imperial Munitions Board. This yard has for its officers Sam Dawe, Sr., president and general manager; Arthur W. Dawe, secretary and treasurer, and Sam Dawe, Jr., superintendent of mechanical construction. The yard is strong on heavy workboat construction. Among those turned out last season was the Armac, a 96-foot oil tank barge, 20 feet beam and 12 feet molded depth. She is fitted with tanks of 35,000 Imperial gallons' capacity and has a 180-horsepower Washington-Estep full diesel engine. Dawe Shipyards, Ltd., has also built several standard design seiners of the 65-foot type. Three high-powered workboats have been turned out, which are speedy and able to keep the sea in any weather. Besides this the ways, taking vessels of 1000 tons and 170 feet length, have been occupied nearly all the time.

A logging tug designed and built by the Dawe Shipyards, Ltd., at Lulu Island, New Westminster, British Columbia. This tug will be powered with a 110-horsepower Union diesel engine.

* * *

John Stokeland, a native of far away Sweden, and a boat builder of ability, specializes in seiners at his New Westminster yard. Last season he built eight of these craft, which are used in the pilchard oil industry. It is only lately that the possibilities of pilchard oil have been taken advantage of by the fisher folks of the Northwest. Salmon was once the only industry along fishing lines, but the tremendous quantities of pilchards in the waters of Vancouver Island inlets and British Columbia sea coast are now being captured for their oil and other products. They are a "seining" fish, and specially built boats are needed for the work. John Stokeland has evolved a very fine type of craft, and in consequence his orders are many, keeping the yard busy at turning them out.

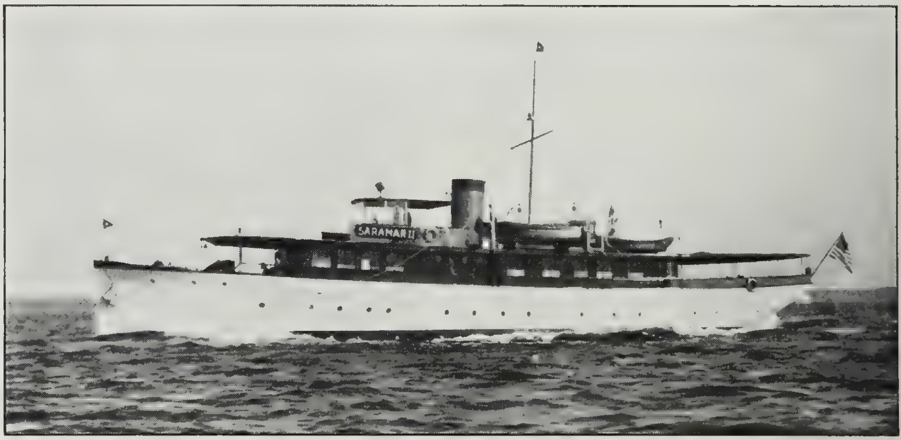
* * *

McKeen & Wilson, New Westminster, are building an exceptionally heavy freight car barge for the Great Northern Railway. They are using the old yard formerly active in war craft building work, but which has been lying idle for some time. The barge under construction is 172 feet length, 46 feet beam, with a depth of 12 feet. She will carry 12 loaded freight cars and ply between Vancouver and outlying ports with railway connections to the coast, but not transcontinental. This will permit freight to reach ultimate destination without unloading cars. The timbers of this big barge are exceedingly heavy and construction is strong to stand the strain of sea and load.

A Californian Snaging B. C. Rivers

Captain John William Rogers was born in Sonoma, California, of New England stock. As a young lad in 1875 he went to Southwestern Canada with his parents. At an early age he took to the sea and grew up in tugs and steamers on the waters of British Columbia. From deck boy to master he climbed the ladder of success, and became an adopted son of the country. For many years he was associated with the seal fishery and knows that game from start to finish. Later he entered the service of the Canadian Government, and is now master of the big snag boat, Samson IV, which is used as an aid to navigation adjunct in the waters of the Frazer River and Vancouver harbor. The government hydrographic officers also use her as their base when making surveys of the bars and banks of the Frazer delta. In this work Captain Rogers aids materially, as his knowledge of the vagaries of the river is of great use. The captain married a lady of Canadian birth, and has a grown family. His home is always open to visitors from the Golden State and he has a most hearty welcome for the folks from his native state. By his thrift and attention to business the captain has gathered a fair store of this world's goods, but is not yet ready to stop work. He has an idea that to rust out is worse than to wear out.

Charles T. Fisher's New Winton-Powered Cruiser Saramar II



Charles T. Fisher's new yacht Saramar II., twin screw, 400 Winton horsepower, 13 knots.

DELIVERY has recently been made of the new 106 foot gasoline cruiser Saramar II at Robert Jacob's yard, City Island, New York. This yacht was built for Charles T. Fisher, vice-president of General Motors Corporation, Detroit, from designs by John H. Wells, Inc., of New York.

The Saramar II, as would be expected in a vessel built for a creator of beautiful coach bodies, is a distinctively beautiful ship—showing, to a remarkable degree, the new trend in comfortable, commodious quarters, without any sacrifice in exterior appearance. The design shows a continuous sheer, steamer stern, and full deckhouse and bulwarks. Accommodations include a forecastle and toilet room for four men with galley immediately aft, beyond which, and separated from the remainder of the vessel by a steel water-tight bulkhead, is a mess room and stateroom for engineer and cook.

Between the mess room and the engine room is one of the owner's staterooms, extending the full width of the yacht, and containing two berths, wardrobe, bureaus, and having its own toilet and shower. This room is reached by stairs from the dining room on deck. The owner's main quarters are abaft the engine room and include a large double stateroom with adjoining bath and dressing room, as well as one single and one double stateroom with a bathroom reached from the passage.

The deckhouse contains dining and living room, captain's quarters, deck toilet and engine casing.

The hull is planked with rift sawn Douglas fir 1¼-inch thick on oak frames 2¾ inches by 3¾ inches. Decks, deckhouse, rails, and trim are of teak and the structure as a whole is very rugged. The yacht's dimensions are as follows: Length over-all, 106 feet; length on waterline, 100 feet 7 inches; beam, 18 feet 9 inches; draft, 6 feet 4 inches. She is powered with two Winton Model 11, 6-cylinder, 9½ by 14 inches gasoline engines, rated at 200 brake horsepower each at 450 revolutions per minute; speed, 13 knots.

Electric current is supplied by a 10 kilowatt, 110-volt Winton generator set in conjunction with Exide "iron clad" batteries. There is also a 4 kilowatt Universal generator as an emergency unit. Delco fresh and salt water pressure sets as well as the bilge pump, sump pump, and starting air compressor are all motor driven and located in the engine room. 2,200 gallons of fuel are carried in three tanks at the after end of the engine room. These tanks are fitted with Pneumercater gauges. The fresh water capacity is 1,200 gallons and is carried in tinned copper tanks under the cabin floor.

Equipment is complete to the last word; there is a Frigidaire outfit, a special Protane gas range built by Elisha Webb & Son Co., motor driven American Engineering Company windlass and boat hoist. The plumbing is by H. J. Curtis Co.

A Tug with a Past

By H. M. Hassell

IN the summer of 1909 when President Roosevelt was encamped on the northern foothills of Mount Kenia, directly under the Equator, he received by native runner the news that Peary had penetrated almost to the North Pole in the steamer Roosevelt, and by sledge and foot had reached 90 degrees north latitude, the point from which every direction was South.

Washington Tug and Barge Company's tug Roosevelt towing the four-masted barkentine Conqueror out to sea.

Today the gallant Roosevelt belongs to the Pacific Coast and is in active service and doing a useful work. She came to Puget Sound waters in 1922 after being purchased by the Washington Tug and Barge Company for big towing jobs in the Northwest and on the British Columbia coast.

The glamour that clothes this staunch craft is such as to quicken the pulse of every man whose veins hold red blood. She is symbolic of the magnificent achievements of men whose spirit ran high and in whose makeup there was a full measure of the hardier virtues.

The Roosevelt carried Commander

(since made Admiral) Peary on his second last attempt to solve the Polar mystery and was the vessel in which the final great feat was accomplished.

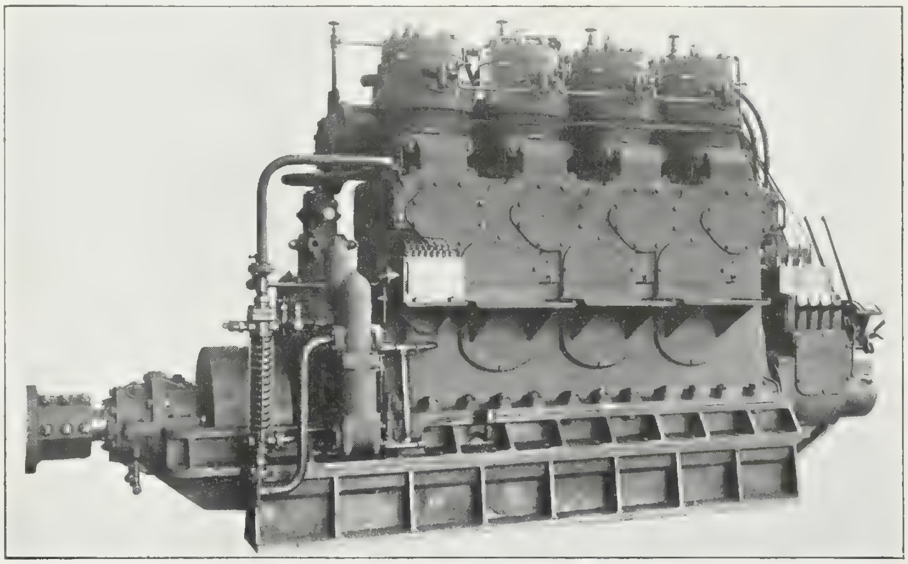
The Roosevelt was built by Captain Charles B. Dix, famous New England shipbuilder. Her keel was laid on October 15, 1904, in the McKay & Dix Shipyard at Bucksport, Maine, and the ship was launched March 3, 1905. Her length was 184 feet over-all by 35 feet beam by 16 feet draft, loaded. This gave a ship of nearly the same length, but a little greater beam, than the English Antarctic ship, Discovery. For battling ice the Roosevelt is built with a bow that falls away sharply so that she may ride up on the ice and break it through by sheer weight. She has a steel bow strip 6 inches wide and varying in thickness from one inch at the top to three inches at the keel, and for 20 feet abaft the forepeak her hull is of solid oak.

Since the Roosevelt became the property of the Washington Tug and Barge Company, Captain J. C. Brownfield, president of the company, has made a slight change in her stern to permit of greater speed. She is powered with 1500-horsepower vertical inverted compound steam engines, and with Almy water-tube boilers. These drive her at a speed of 14 knots. It is said that the Roosevelt is the most powerful tug on the west coast.

Of considerable interest is the Roosevelt's present deck machinery and towing equipment. She has an American Engineering Company towing machine to handle her 2000 feet of 2-inch steel tow cable. For handling forward, breast, and spring lines she has four winches on the forward deck and two on the after deck for stern lines, all made by the American Engineering Company.

She is equipped throughout with Warren marine pumps of the centrifugal type and has a pair of big Dunn stockless anchors. For electric lighting there is a 5-kilowatt, 110-volt, direct current generator made by the General Electric Company. The latter also furnishes power for a complete Radio Corporation of America wireless telegraph installation. The Roosevelt is also equipped with 60 cells of Willard storage batteries supplying 120 volts of direct current to the lighting circuit, in case of emergency. This set is kept charged by the General Electric direct current generator.

Recently the Roosevelt towed the ex-U. S. Navy hospital ship Comfort from San Francisco to Seattle to be rebuilt by the Todd Dry Docks, Inc. During the voyage a 60-mile gale was encountered off the Oregon coast, but the staunch old fighter was able to hold her own in spite of the wind and her heavy load. On another occasion the Roosevelt towed three million feet of lumber on barges from Puget Sound to Miami, Florida. When off the bay of Tehuantepec she lost her rudder, but for twelve days successfully handled her big load and eventually made Balboa safely.



Worthington 2-cycle, solid injection, 4-cylinder, 120-horsepower marine type diesel engine.

Worthington Engines for Workboats

THERE has recently been placed on display at the San Francisco warehouse of the Worthington Pump and Machinery Corporation a 4-cylinder, 2-cycle, solid injection, marine type diesel engine of 120 horsepower. The Worthington company builds this class of engine in sizes from 50 to 54 shaft horsepower and recommends this type for installation in launches, yachts, patrol boats, fishing boats, tugboats, dredges, and for auxiliary power on all types of ships.

This type of Worthington engine is of the simplest possible construction and involves a minimum of attendance and maintenance. There are no mechanically actuated spray valves on the engine. Materials and workmanship are of the highest grade. All moving parts are enclosed. No delicate adjustments of any kind are required.

In general construction this engine is a complete and satisfactorily built power unit with simple and easily operated controls. It is of the cross-head type, having double guides, bored concentric with the cylinders. This guide is closed at the upper end and the piston rod passes through a stuffing box and an oil wiper. Scavenging air for cylinders is admitted through feather valves to a chamber above this stuffing box; thence by a discharge feather valve to the cylinder. This construction eliminates all contamination of scavenging air by the lubricating oil of the crank case.

The engine is fully reversible. After starting the engine with compressed air, one motion of the reversing lever, either in the ahead or astern direction, arranges the mechanism so that upon throwing on fuel, the pump will immediately and automatically operate in the proper direction and with the correct timing. The engine bed plate is extended aft to carry the thrust block. A unique feature of this marine type is the assembly of service pumps and maneuvering air compressor at the after end of the engine. The water jacket circulating pump, the bilge pump, the fuel oil service and lubricating oil pumps, together with the maneuvering air compressor, are all driven off one large eccentric carried on the main shaft.

A. R. Thorson, San Francisco district sales manager, and V. A. Stout, marine sales manager for the Pacific Coast, will be very glad to display the merits of this engine to interested parties.

Auxiliaries—Ship Supplies—Marine Equipment

Two New and Valuable Aids to Navigation

The Magnetic Master Compass and the Path and Position Indicator

By Robert G. Skerrett

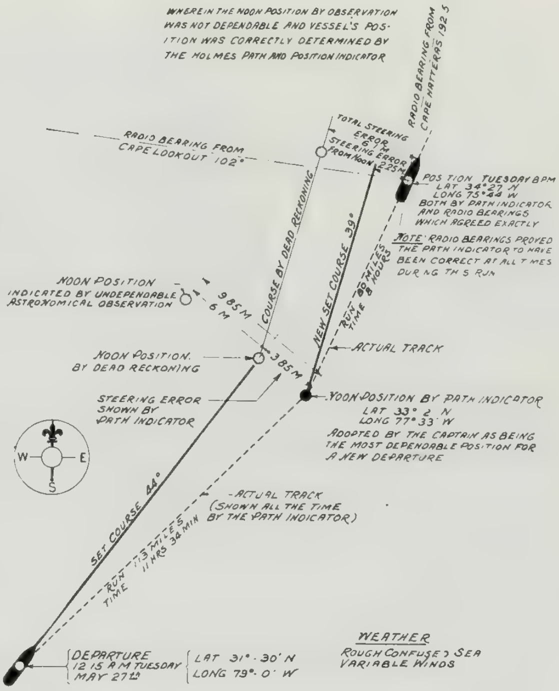


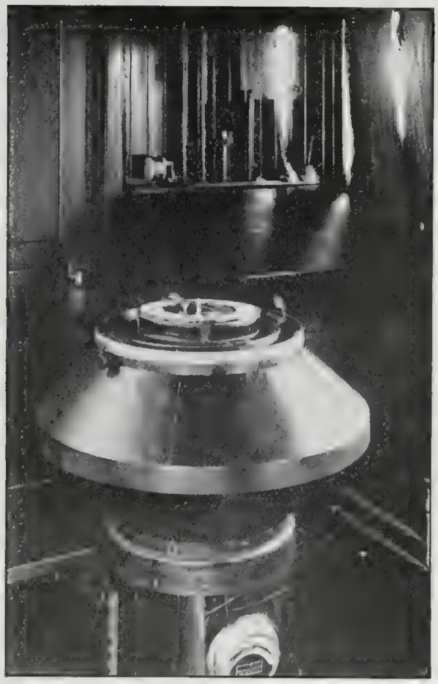
Chart showing the result of a deep sea test of the Holmes path and position indicator. It is obvious that in this case if the ship had been steered by the path and position indicator she could have been held precisely on the desired course.

TWO very valuable aids to navigation have recently been perfected and brought to a practical form as the result of years of research and study by Edward L. Holmes of New York. These instruments, called the Holmes magnetic master compass and the Holmes path and position indicator, have now been brought to manufacturing stage by the Holmes Navigating Apparatus Company of New York and have been subjected to rigid tests both ashore and afloat and found capable of doing all that is claimed for them by their makers.

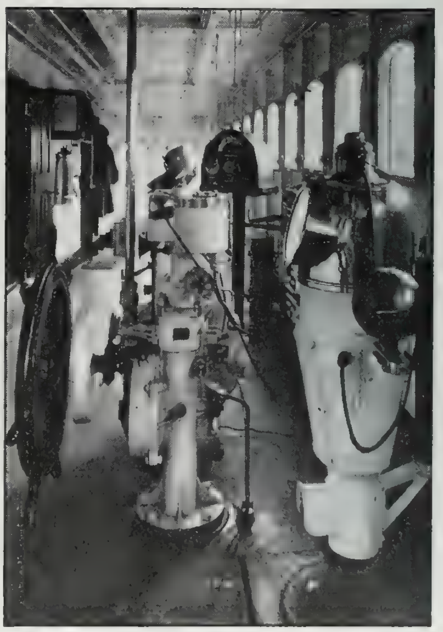
Although the path and position indicator can be controlled either by a gyro compass or by the magnetic master compass, as has been established by long voyages at sea, the instrument was originally conceived as a companion apparatus for the Holmes magnetic master compass. For a broad understanding of the Holmes liquid compass, it will suffice now if we say that the movement of the compass needle, in a special electrolyte, alters or unbalances the resistance of two opposing electric circuits through which a weak alternating current flows.

To make this possible, the needle float carries four quadrilaterally disposed platinum electrodes—terminals, respectively, of insulated sections of the two opposed electric circuits—and on adjacent sides of the bowl are four segmental plate electrodes, also of platinum, so as not to be injured by the electrolyte. There is always a fluid-filled gap between each electrode on the magnet float and its neighboring electrode on the side of the bowl; and it is the interval between each pair of electrodes—varying according to the direction in which the magnet float moves—that determines the measure of resistance offered to the current as it flows through the opposing or opposite electric circuits.

Manifestly, any angular movement of the magnet float must upset the normal balance existing between the two circuits when the float is at rest; and this unbalancing is utilized to affect a sensitive relay which, in its turn, controls a small reversible motor. The motor causes a follow-up ring, mounted above the compass bowl, to turn to the right or to the left so as to bring the markings on a phantom compass card in accord with those of the regular card in the bowl. As the follow-up ring is thus moved to right or left by the motor until unison is effected between the two compass cards and the two circuits are again balanced, the ring travels over a succession of contacts by which electrical impulses are transmitted to one or more step-by-step motors that actuate the dial or dials of a corresponding number of repeater compasses. In this manner, the repeaters are made to register in harmony with the magnetic master compass. Should the follow-up system be out of service for any reason,



The Holmes magnetic master compass aboard an American tanker.



The Holmes path and position indicator hooked up with a gyro compass as installed in the pilot house of a large American freighter.

the magnetic standard compass—the heart of the system—would be left unimpaired to serve its intended purpose as the prime navigational aid.

The Holmes magnetic master compass actuates a repeater compass card on the path and position indicator. And it is by this repeater card that the course is set from any point of departure. When that course is set, the hand on a dial immediately below the compass will point at zero. This hand carries a white star to make its movement more readily observable by the man at the wheel; and the shifting of this hand at once warns the steersman that he is to the right or to the left of the set course—the dial scale reading to three decimals of a mile. To bring the ship back on the set course, not parallel with it, the man at the wheel must steer the vessel so that the star hand shall be at zero and so that the hand above the instrument's compass card shall be in line with the prescribed point. As can be seen, the path and position indicator does away with all guessing on the part of the steersman, and gives him a positive guide by which he can bring his ship quickly back upon the set course after her head has been swung to right or to left of that course by yawing or by careless steering.

Two other dials are provided on the front of the path and position indicator. One of these registers the distance made good in relation to the set course and the other registers the amount of departure, at any time, from that course. The readings are based upon a speed of one knot an hour; and to make them applicable to a given ship it is necessary only to multiply them by the known speed of the craft as determined by her log or revolution counter. With the two sides of the triangle this obtained, it is an easy matter to ascertain the ship's position so far as that position is the result of steering—a very fruitful source of error in computing a vessel's position by dead reckoning.

Close-up of present form of the Holmes path and position indicator.

As should be readily understood, the path and position indicator is used as a steering instrument instead of the time-honored steering compass alone, and is placed in front of the man at the wheel. The magnetic master compass, on the other hand, can be mounted wherever is most convenient for navigational purposes and where it will be farthest removed from local disturbing influences; and, when so situated, it can be used to control the compass dial of the path and position indicator, as well as the dials of any desired number of repeater compasses.

The Holmes Navigating Apparatus Company has not only put the finishing touches upon the magnetic compass by giving it the much desired powers of a master compass—a very remarkable achievement—but it has produced an extremely valuable aid to the mariner in its path and position indicator, an instrument that will undoubtedly add to safety at sea and to economy in operating a ship at all times when she is under way.

When to Discard Wire Rope

JUST when to discard wire rope as worn out is a question on which no definite rules can be applied. Too much depends on the local application of the rope and the degree of maintenance attention accorded during its period of service. Metallic area apparently unharmed cannot alone be taken as a criterion since two ropes from the same reel, showing the same degree of wear and number of broken wires, may show under test a variation of 25 per cent in reserve strength.

There are several reasons for this variation, the principal of which may be that one rope may have been subjected to excessive acceleration stresses which greatly fatigued the steel, causing considerable loss of strength; whereas the other rope may have operated under a more uniform tension and was never overstressed, with a much higher showing in strength as the result. Another factor might be the presence or absence of proper lubrication which, of course, would greatly affect the degree of corrosion—not always visible.

Derrick ropes. For boom topping lift, fall or hoisting lines, the ropes should be discarded when there are six or more adjacent wires broken in any one strand or when the outer wires have been worn to one-half their original diameter.

Holding, closing, and boom lines on locomotive cranes should be discarded in conformity with the rules given for the "derrick ropes," but when examination of ropes is made, attention should be given that part of the rope passing over equalizing sheaves for the reasons set forth above.

In the discarding of wire rope consideration should be made of the type of rope employed. It has been known, for instance, that a length of preformed wire rope, discarded as completely worn out, was capable of giving nearly twice the amount of service secured. The case in mind was found in a large steel plant in the Pittsburgh district where preformed type of wire rope was being worked in opposition to another type on a converter crane that used two ropes. Later this discarded length of tru-lay cable was put back into service with the result that it was found to be in good condition and capable of giving an amount of service almost equal to that already obtained.

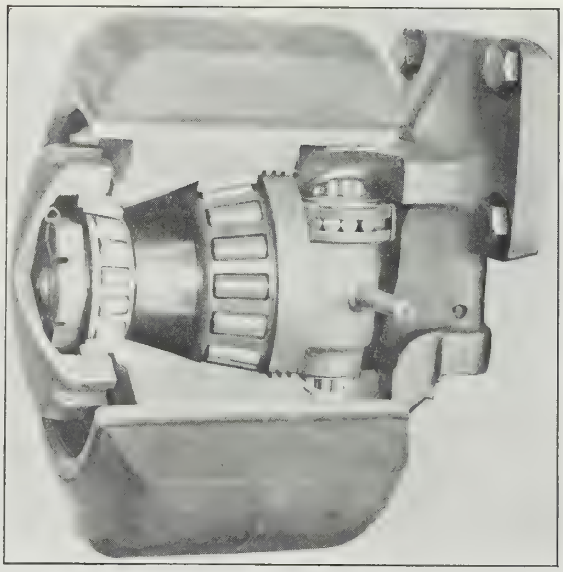
There are many places where life or limb will not be endangered by the breaking of a wire rope, such as car hauls, car transfers, spotters, and hot beds in steel mills. In such application a wire rope might conceivably be used until an entire strand breaks, but this general rule, of course, has no application to installations that might, in case of emergency, endanger workmen.

Credit for this information should be extended to C. D. Meals, Rope Engineer, American Cable Company, New York.

New Yale High-Lift Truck

IN the new Yale Model K25, 3-ton high-lift elevating truck advantage has been taken of the excellent features that experience has introduced into the older units, and at the same time the cost has been maintained at a reasonable figure by the use of pressed steel, drop forgings, dies, and general production methods.

The backbone of the frame work comprises mainly a large gusset plate, one-half inch thick, and extending from the very forward end of the truck to the small or trailing wheels. This plate is approximately 24 inches in height at driving wheel axle and provides a yoke guide for the drive unit and the spring suspension of the truck.


Steering knuckle and spindle assembly for the small wheels of the new Yale high-lift truck.

The elevating platform is raised and lowered by two 1½-inch diamond roller chains passing over power-driven sprockets at the bottom, and idler sprockets at the top. Hyatt heavy duty roller bearings are used for the idler sprocket shaft. The shafts of the lower sheaves run in a bath of oil, which also serves to lubricate the spur-gear reduction unit. The ends of the roller chains are attached to the platform through a spring take-up device. It is estimated that the life of this hoisting chain in normal service will exceed five years.

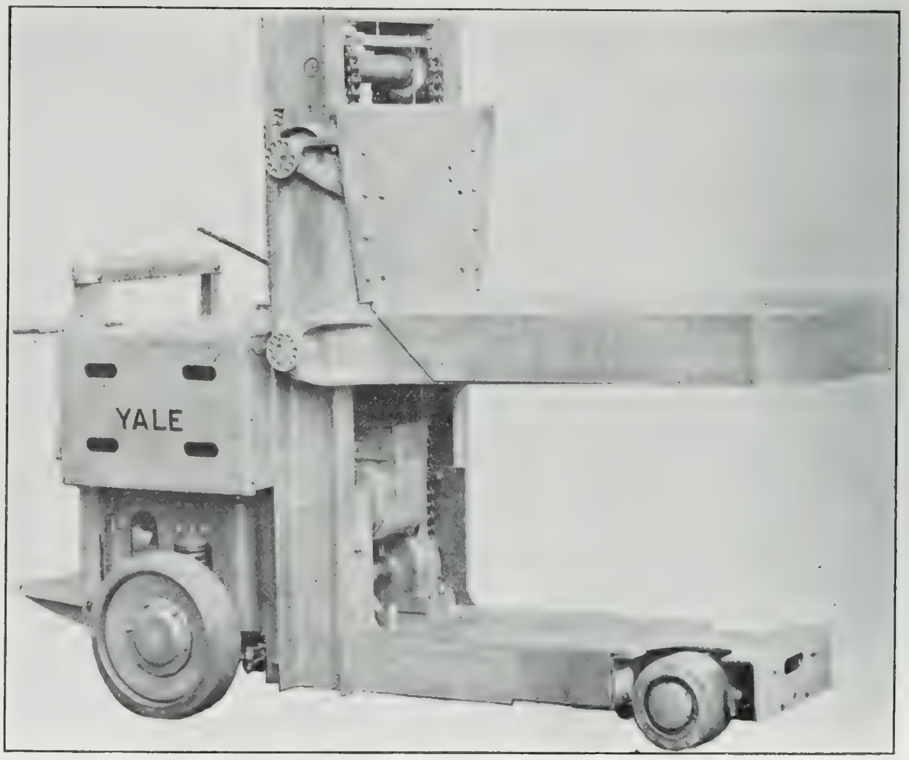
The hoisting motor is connected to the spur-gear pinion through a spring ratchet, so arranged that a positive drive is obtained when raising the elevating platform. If, however, the platform was checked in its downward travel, the ratchet would merely release and, therefore, cause no injury to the mechanism of the truck. The ratchet when slipping makes considerable noise, so that the operator is immediately warned of the fact that the truck platform is bearing on some obstruction. Due to the high efficiency of the roller chain and the spur-gear reduction in the hoist unit a speed of 7½ feet per minute is obtained when lifting a full load, and a speed of 19 feet per minute when raising the empty platform. The lowering speed is 19 feet per minute loaded or empty.

The elevating platform of the truck is supported in the horizontal position by four roller bearings on the inside of the flanges of the vertical ship channels. These channels have a depth of 9 inches and a flange of 3½ inches, so that a relatively large diameter roller, with a wide face, is possible. The rollers are equipped with Hyatt "heavy duty" roller bearings, and with a hardened steel thrust washer to take whatever end thrust may occur when lifting loads that are not placed on the center line of the platform. The platform members are heavy steel castings, having large diameter bosses to support the platform roller spindles and to make room for the eccentric adjustment of the hub and flange of these spindles by means of which any wear on rollers or guides can be compensated and the platform maintained in a level position.

The main drive unit is of the double reduction spur-gear type, driving through totally enclosed universal joints. The entire gear reduction with its differential and bearings run in a bath of oil.

All steering knuckle king pins have been fitted with ball and roller thrust bearings. On the small wheels, which come directly beneath the load, the steering knuckle king pins, in addition, are equipped with an upper and lower roller bearing to take the radial load, and each small wheel assembly contains five bearings.

The four-wheel steer feature allows a turning radius of 96 inches to the outside edge of the truck.



New Yale Model K-25 3-ton high-lift elevating truck.

Rix Auxiliary Booster

THE Rix Compressed Air and Drill Company of San Francisco has for many years manufactured a very high class line of compressors for industrial work. More recently this firm has designed and built an interesting line of air compressors especially designed to meet the demands for an efficient and reliable auxiliary compressor for use in diesel engine rooms afloat and ashore. Many of these have been built and are in service throughout the United States and aboard some of the largest and finest diesel engine ships afloat.

Requirements in diesel motorships vary from 8 cubic feet to 300 cubic feet of free air displacement per minute against 200 to 350 pounds pressure for maneuvering air tanks and from 8 cubic feet to 88 cubic feet free air displacement per minute at pressures from 1000 to 1500 pounds for injection air tanks. All of these compressors are fitted with Rix valve system using steel disc valves, the light weight of which, combined with limit clearance, enables these compressors to give very satisfactory volumetric efficiency.

One of the most interesting special developments for motorships in the Rix line is the compressor known as the Rix auxiliary booster. This machine is usually used in connection with the Duplex two-stage compressor, which takes the atmospheric air and raises it to a maximum of 350 pounds for the maneuvering tanks. The booster in case of emergency takes the pressure at 350 pounds and boosts it to 1000 or 1500 pounds to fill injection tanks. This compressor is very carefully made and is stocked regularly in sizes of 1-inch to 1 1/8-inch diameters of cylinders, corresponding to free air capacities of 7, 21, and 40 cubic feet per minute respectively. When motor driven, these boosters take a 3, 5, or 10 horsepower motor.

One excellent feature for marine power plants connected with the use of this auxiliary is that in the case of a break-down of the regular auxiliary, the booster will, if carefully used, take the air at atmospheric pressure and fill the tank to sufficient pressure to start the engine.

The Rix Compressed Air and Drill Company is equipped and ready at any time to build compressors to any "specification that promises effective results" and to install these compressors in a manner that will insure efficient service.

New Time-Delay Push-Button Station Keeps Motors Running

GENERAL ELECTRIC announces a new push-button station for use in preventing the cutting out of motors controlled by a magnetic starter, when there is a brief power disturbance. The station has two push buttons, "Start" and "Stop," and bears the General Electric designation CR-2940-BS-82-A.

This station is used with standard magnetic starters, making it unnecessary to add time-delay attachments to the starters themselves. When power fails, the magnetic starter will, of course, drop out, but will be caused to reclose upon the return of voltage by the push-button device, unless the time for which the push-button station is exceeded, when the "Start" button must be pushed to energize the magnetic starter and so restart the motor.

In operation, pressing the "Start" button of the push-button station closes the pilot circuit of the magnetic starter and also the circuit of a coil in the push-button station. This coil is part of a "lift" solenoid and, when energized, causes the solenoid plunger to rise. At the bottom of the plunger are spring-attached contacts which are closed by the lifting action thus maintaining the circuit through the solenoid itself and also the pilot circuit of the magnetic starter with which the device is used.

When voltage drops sufficiently to permit the solenoid to release the plunger, the latter starts to fall but is retarded in its downward movement by a rack which turns a gear. The gear engages a rachet which can be adjusted for a maximum of 1½ seconds by means of a heavy nut at the end of the rod which serves as a pendulum. If power does not return before the time expires for which the device is set, then the contacts will be opened and both the solenoid and the magnetic starter will be disconnected until the "Start" button is again pushed.

Pressing the "Stop" button stops the motor immediately, because this action immediately opens the pilot circuit of the magnetic starter and likewise disengages the rack of the solenoid plunger so that the latter falls instantly.

A General-Electric Melon

SUPPLEMENTARY compensation totaling $1,403,723.14 was distributed in August to 31,436 factory and office employes of the General Electric Company who have been in the employ of the company for five years or more. The payments represent five per cent of the employes' earnings for the six months ended June 30, 1927, and were made in General Electric Employes Securities Corporation bonds or in cash, as the employes desired. The amounts paid in the various divisions of the company included:

Schenectady Works	$456,034.57
River and West Lynn	259,778.49
Pittsfield Works	124,920.02
Erie Works	83,993.75
Fort Wayne Works	89,017.11
Other works	82,723.47
Incandes't Lamp Dept.	139,386.92
General Office	62,374.87
District Offices	99,762.10
Other departments	5,731.84
Total	$1,403,723.14

Lipman Service

C. Sowers, Pacific Coast representative of the General Refrigeration Company, announces that E. O. Northquist, formerly of the engineering staff of the Pacific Steamship Company, has been appointed Lipman marine refrigeration engineer with the Power Plant Engineering Company of Seattle and Portland, Northwest distributors for Lipman units.

This appointment will enable the Power Plant Engineering Company to give highly specialized marine refrigerating engineering service to all of its patrons in the Pacific Northwest territory; and to offer expert advice in solution of marine refrigeration problems to all those who are planning refrigerative service aboard ship.

The Willamette Institution

THE Willamette Iron and Steel Works, organized in 1865, was one of Portland's first industries, as well as the Northwest's first important venture in metal working. Its development from a very modest enterprise in the early years of its establishment, to the mammoth plant of today, has been the result of natural growth. This growth can be directly attributed to the high standard of quality of Willamette products and the maintained service to the consumer.

The present plant occupies a twelve-acre harbor site, with deep water frontage. Buildings of the plant, large and small, are nearly a score in number, ranging from the large boiler and machine shops to the smaller service buildings. Herein is housed the most modern and efficient machinery for every purpose in the field of mechanical engineering. The combined shop units comprise one of the most complete plants in the West for the manufacture of high quality, heavy duty machinery. The combination of the above manufacturing facilities, together with the strategic geographical location, enables this plant to serve customers with the maximum of economy and expediency.

The Independent Foundry Company, which manufactures gray iron products exclusively, is located adjacent to the plant and is specially equipped to handle the large tonnage castings used. This foundry has the largest output of any gray iron foundry in the Northwest and is owned and operated by the Willamette Iron and Steel Works.

Many years ago, when river steamers came into use on the Willamette and Columbia Rivers, the Willamette Iron and Steel Works built the first marine steam engines used in these craft, and achieved an enviable reputation for this line of machinery. Many of these stern-wheel steamers are still running and furnish fine examples of high quality manufacturing and design.

Marine repairs of all kinds are handled. During the late war, outfitting of ships for the Emergency Fleet Corporation was one of the principal activities. The production of large Scotch marine boilers during this period was said to have been greater than that of any other plant in the United States. At the close of the war a 60-ton Scotch marine boiler was completed for shipment every working day.

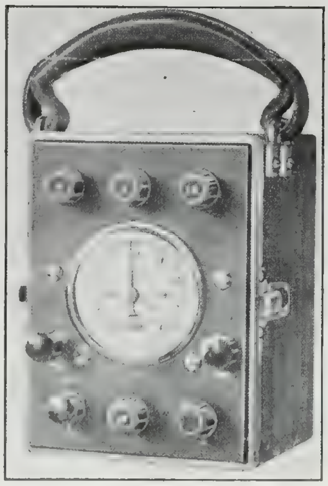
Experience gained through these years of manufacturing high standard quality machinery of all kinds enables the Willamette Iron and Steel Works to build the Sumner-Willamette diesel engine, as an engine that is right mechanically and is the best in design.

New Westinghouse Portable Standard Watt-Hour Meter

A NEW type OB portable standard watt-hour meter, has recently been placed on the market by the Westinghouse Electric and Manufacturing Company.

The new meter has several advantages, the outstanding one being the compensation for temperature errors at both unity power factor and low power factor. This compensation is inherently permanent for both the electro-magnets and the permanent magnets and does not depend on the movement of mechanical parts with the variation in temperature.

Superior accuracy is obtained along with a decrease in size and weight. These latter features are important considerations in a portable meter, especially where a great many meters are to be tested at widely separated points. The micrometer adjustments have been simplified and the electro-magnets are of the one piece OB type. A zero reset is provided by which both pointers can be set on zero. Potential settings are changed by means of a small switch, and three current binding posts are used, so that the meter may be connected for either 1 or 10 ampere capacity.



New Westinghouse portable standard watt-hour meter.

Ship Crane Test

The Daughs Ship Crane Company of Portland, Oregon, is to have an official Shipping Board test under practical operating conditions. The Daughs ship crane is familiar to readers of Pacific Marine Review, having been fully described in these columns. The Shipping Board has assigned the steamer West Haven under charter to the Daughs Ship Crane Company, who will install, at their own expense, three cranes aboard of this vessel. The vessel will be placed in the intercoastal trade and a test of the cranes made under the supervision of Shipping Board officials.

The Daughs Ship Crane Company is certainly registering good faith in demonstrating, at its own expense, this efficient cargo handling device.

Postage Stamp Motor

A motor so small its rotor could be wrapped in a postage stamp is used by the Westinghouse Electric and Manufacturing Company, for timing the OB watt-hour meter demand register. It is the smallest synchronous motor ever manufactured for practical use. Four million of these complete motors, together with their reduction gears, would be required to balance an 8000-horsepower motor recently built in the Westinghouse shops. The diameters of their shafts are in the ratio of 512 to 1. The rotors are still smaller in proportion as 37 million would be required to equal the weight of the 8000-horsepower rotor. While two men, one on the other's shoulders, could stand upright in the circular opening for the rotor in the 8000-horsepower motor, the rotor of this motor could be worn, set in a ring, on a man's little finger; yet the small rotor must be made with as much or more attention to detail and to fine machining than is used with the large power unit.

Marine Insurance

Edited by JAMES A. QUINBY

Glamor

A Sermon About the Other Fellow's Job

MOST of us have felt at some time or other—noticeably on Monday mornings—that dabbling in marine insurance was a pretty dry sort of business, in spite of the amount of sea water encountered and the number of underwriters we knew who were all wet. There is something more or less discouraging about being chauffeur to an adding machine or loud speaker for a ratebook, and there are very few snappy anecdotes in our best bordereaux.

Now this incompatibility of employment is not confined to the humbler (and consequently happier) members of the profession. Many a powerful and respected Branch Manager has his moments when he wonders what it's all for, anyway, and sadly realizes that it will be five whole days before he can shoot another round in seventy-seven, or a hundred and seventy-seven, or what have you.

Treasure

My grandfather's barn was a cave of delight
When I was an urchin of ten.
Its treasure-filled darkness held certain respite
For the worries that troubled me then.
There were reapers and binders and rakes by the score
That were dear to my eager young heart,
And doodads galore on the granary floor,
All meant to be taken apart.
I miss, as I sing, the mechanical thing
That is meant to be taken apart.

But now, when I yearn for an Eden complete
Where treasures unnumbered abound,
I shuffle my feet to the waterfront street
Where the warehouse of Jim Seale is found.
He has the merchandise there, exotic and rare,
From the cargoes of ships that have sunk,
Which some folks declare with a critical air
To be just a collection of junk.
Quite true, in a measure, and still it's a treasure
Of priceless and glorified junk.

J. A. Q.

To be more or less serious, a remedy for this sort of thing is absolutely necessary, and should be dignified with a plank in some party platform, along with the five-cent cigar, the standard bill of lading, and the all-risk policy. Perhaps we should mention at this point that all those who are able to solve this great national problem by devoting themselves permanently to golf may rise quietly and leave the room. There, that's better.

What To Do?

Nine-tenths of the dissatisfaction with any particular job is purely imaginary. There never was a theatrical stock company in which the juvenile wasn't secretly convinced that he had the heavy outclassed four scowls and a damn when it came to building up a pre-war Simon Legree. And who has ever talked politics with a voter who couldn't give the Administration a full twenty-four hour day of good sound advice on how to run the country.

To the young and uninitiated, a calling is desirable in exactly inverse ratio to its apparent quota of good hard labor. To the appraising eye of the ten-year-old, the locomotive engineer and the policeman have the most alluring jobs in the world. And yet, when our trousers and faces have lengthened with the passing of the years, very few of us are running around trading in our last year's jobs on a nice new patrolman's beat. We have learned in the meantime that our childhood heroes, behind their brass buttons and symbols of vested authority, have just lots and lots of good hard work to do. But do we learn a lesson from this? The answer is not at all. We merely substitute some other profession as the object of our childishly wistful regard—some glamorous figure such as the foreign trader, the shipowner, or the geological engineer. The actual romance which attaches to these apparently desirable professions is unimportant. In picking a good job-hero, the only thing which really matters is that the hero-worshipper must know absolutely nothing of the details of the hero's job. A mere suspicion that the hero has a past—or, worse still, a future—that is tainted with any appreciable amount of hard work is enough to furnish that particular idol with a brand-new pair of clay feet and relegate him to that obscure limbo of false gods where dwell the policeman, the locomotive engineer, and other lode-stars of yesteryear.

Who's Your Hero?

The funny part of it is that almost any hero, on close inspection, turns out to have the shameful stigma of labor attached to his pedigree. We are informed on reliable authority that even the silver-hazed thespian of the shimmering screen, commonly referred to as the movie actor, has to work like the very devil for his umpty-thousand per week. And it has even been whispered in the highways and buy-ways of the land that the average cinema star does not really drag down the aforesaid umpty thousand per—(per week, year, or lifetime.)

Arthur M. Brown **EDWARD BROWN & SONS** *Arthur M. Brown, Jr.*
MARINE DEPARTMENT—*Harry W. Browne, Manager*
PACIFIC COAST GENERAL AGENTS
THE GLOBE & RUTGERS FIRE INSURANCE CO., INC.
200 BUSH STREET, SAN FRANCISCO

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FRANK G. TAYLOR, MANAGER, PACIFIC NORTHWEST BRANC

We realize that this is a serious statement. The age-old responsibility of the iconoclast rests heavily on our shoulders. We are putting ourselves in the position of the abysmal brute in the classical story, who sadly but firmly tells the sweet girl graduate that there ain't no Santy Claus. Realizing all this, we stand by what we just said, in spite of the fact that there isn't a dry eye in the house. Our conscience is our guide. Our conscience must have something to do, you know.

So after all, the ideal job-hero is nothing more nor less than a figment of the imagination. Now imagination is a great thing. Men with high-proof imaginations have been known to get roaring drunk on near-beer. But—and now let's borrow a slogan from the children of the fire insurance class—a good imagination is an excellent servant, but a poor master. A good imagination, properly oiled and in smooth working order, can be trained to warm the slippers and perform various chores around the house. The main thing is to keep the beast at home and not let it wander around on the other fellow's job.

Imagination Begins at Home

So keep the old imagination trained on your own job. That's our text and we'll stick to it. Perhaps we should have mentioned that this is a regular old-fashioned down-east sermon, with a text and everything. (Note: At this point, half the audience rose and tiptoed out. The remaining listener was later found to have been asleep during the entire evening.)

Now take this marine insurance business, for example. We're all in it, whether we sell it, or buy it, or interpret it. How many of us take the time to learn anything about the romance of the game?

Most business men are stifled by an atmosphere of modernism. Many callings have no traditions and their neophytes may be forgiven if they regard their work as prosaic and monotonous. Such a lack of background cannot be imputed to the Ancient and Honorable Brotherhood of Assurers Maritime. Down through the ages we have had background of romance. We are one with the seafarers of bygone Phoenicia and Carthage, who put forth in their frail craft and welded from the fire of necessity the first general average. We carry on the hazards set by the Romans who issued bottomry bonds and coverages on corn cargoes during the Punic Wars. Did you ever read, in Hakluyt's English Voyages, of the sturdy British tradesmen who penetrated to Moscow and Aleppo when the territory of White Russia and the North Crimea were as little known as far Thibet? Some of these days, when there is a slight lull in the persistent clamor of clients for more coverage, take a few minutes off to read of the difficulties encountered by the pioneer traders and insurers of the Fifteenth Century during their wanderings in the country of the Great Khan, where the cocoons of the silk worm were hung in bags under the arms of children to hasten the spring season. Rather an underhanded trick, at that. Like putting electric lights over the hen-roost.

Nor do we have to go into ancient history to find a romantic background for our calling. There is glamor enough in the geographical development tied up in the business of cargo insurance. Skins and furs from the Hudson Bay posts of the far north have been objects of tender solicitude for underwriters for more than two centuries. The blackest hinterland of Darkest Africa sends gum, palm-oil and ivory to pay or exact its toll from marine insurance coffers, as the case may be. Grain from the Nile Valley and copra from the Pacific Isles, coffee from South and Central America, peanuts and soy beans from China all jostle one another for the privilege of paying premiums to the marine underwriter. Even the grim Antarctic land of Tierra del Fuego now exports wool and mutton. No land is too barren, no people too primitive, to be touched by the far flung protection of marine coverage.

There is, in short, material for many a good story book in the records of the average marine office, and romance and drama can be wrung from the dryest of cases by the application of a little study, tempered with a liberal dash of imagination.

Mixed Cargo

Most of us are familiar with the wording of the sue and labor clause in the ordinary English marine policy, providing, among other things, that the assured has the privilege and duty to "sue, labor, and travel" in reducing or avoiding loss. The purpose of the clause, of course, is to make sure that the assured will take steps to minimize losses. He is protected by the underwriter's agreement to pay for such efforts, even should a total loss occur.

One of our insurance friends ran across a prospective client the other day who didn't see it that way at all.

"No, sir," he said, "I won't have any such clause in my policy. You take out that word 'travel.' Why, you'd have me travelling all over Europe investigating claims on my shipments."

INSURANCE COMPANY
Freights and Disbursements
STREETS, SAN FRANCISCO, CALIFORNIA

W. H. WOODRUFF, Manager, Southern California Marine Branch
740 SOUTH BROADWAY
LOS ANGELES

CHARLES R. PAGE, Manager
ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

309 COLMAN BUILDING, SEATTLE, WASHINGTON

After a long argument he finally took the policy, but he expects a hurry call to Europe at any time.

From the viewpoint of the man in the street, it pays to have an underwriter who is not too technical. The Insurance Company of North America was recently asked to settle a claim on the power barge Dorothea, which was damaged by striking a submerged pile of rock and concrete which had been placed in supposedly navigable water near the Albers dock in Oakland.

The policy covered against collision with "wharves, stages and/or jetties." Quite an argument could have been made that this was a stranding, rather than a collision under the policy. The North America, however, came through handsomely and paid the claim in full.

As a matter of fact, this so-called "fire and collision" coverage on bay and river vessels is no bargain for the underwriters, after all. The clauses used by Pacific Coast underwriters vary somewhat in their wording, but most of them protect against collision with landings, stagings, jetties, or similar structures.

Under such wording, the policy would cover against damage resulting from collision with the masonry and retaining wall on Alcatraz Island in San Francisco Bay. It would protect against collision with almost any kind of obstacle in the bay and river, so long as the obstacle proved to be artificial in nature. In the instance of the Dorothea, the rip-rap or retaining wall, at the Albers wharf had been in place for several years, and the United States Engineers, in compiling the 1926 chart, failed to show it, on the theory that it had changed its nature from an obstruction in navigable water to a part of the shore line.

About the only thing the clause does not protect against is the pure or garden variety of stranding, which on the mud or sand bottom of rivers or harbors, usually causes no damage anyway.

A situation somewhat analogous to the above is found in the application of the Inchmaree Clause to gas-boats.

The Inchmaree Clause, with its coverage against damage caused "through breakage of shafts, or through any latent defect in the machinery or hull," was originally designed for use in hull policies covering steam-propelled vessels. Even as applied to such vessels, the clause has a latitude which interpretations of passing years have made more and more elastic.

The underwriter who holds to the worn-out belief that a latent defect is something unusual may with some justice be compared to the well-known ostrich. The Inchmaree Clause, as now written, covers almost any kind of failure or malfunction in machinery. If the insurer intends to cover this extensive (and expensive) field, well and good, but if he clings to the fatuous theory that he is giving a mere limited machinery coverage, it is high time the clause were deleted or expanded.

If these objections are pertinent in the case of ocean-going steamers, how much more serious they must be when the clause is applied to gas-boats, where mechanical breakdowns are of every-day occurrence. We believe the Inchmaree Clause is out of place in hull policies covering such craft. Whenever an underwriter pays a machinery loss under a gas-boat policy, he feels like John D. Rockefeller giving away two dimes at once, and if he refuses to settle, he stirs up a storm of lawsuits and misunderstanding.

Stages and Barges

We are accustomed to speak glibly at times of stages of seaworthiness, and most of us are familiar with the celebrated and venerable case of Bouillon versus Lupton (1863-33 L. J. C. P. 37) establishing the principle in question, but it is rather surprising to find a recent English decision, Albert E. Reed & Co. versus Page, Son and East (XXXII. Com. Cas. 243), in which the Court of Appeal presents the doctrine in a new light.

In the Bouillon case, a vessel insured under a voyage policy reading "from Lyons to Galatz" left Lyons, a river point, with a river crew and master and without her masts, anchors, and sundry other heavy equipment which it was impossible to carry while navigating the river. At Arles, a point near the mouth of the river, she took on board her sea captain and part of her seagoing equipment. At Marseilles she was fully equipped for sea and was so equipped when she was later lost, on the course of the voyage insured, in the Black Sea.

The insurers resisted payment of the loss, contending that the vessel was not seaworthy at the commencement of the risk. The court held that at every stage of the voyage, the vessel was seaworthy for purposes of that particular stage—that on leaving Lyons, for example, she was fully equipped for that part of the voyage between Lyons and Arles, and that the mere fact that she left Lyons without her full deep sea equipment did not breach the warranty of seaworthiness.

In the Reed case, the defendants were London barge owners, whose contracts contained the usual London Lighterage Clause exempting from liability for negli-

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gence of employees. In December 1925, the plaintiffs were expecting a consignment of 500 tons of pulp by a Norwegian steamer, the Borgholm. They instructed the defendant to send barges to meet the vessel and carry the pulp up the Thames. One of the barges, called the Jellicoe, was designed to carry 170 tons in safety, but by an error of one Arnold, an employee of the defendants, more than 190 tons were put into her, with the result that she overturned and sank while lying alongside the Borgholm.

The defendants contended that the loss was a direct result of the negligence of Arnold, for which they might have been liable but for the Lighterage Clause. They further pointed with pride to the fact that the lower court had expressly found that the Jellicoe was seaworthy to carry 170 tons when she left port loaded.

The plaintiffs, on the other hand, insisted that the Lighterage Clause gave no protection where there was unseaworthiness, and that the barge here was unseaworthy in that she was not fit for the whole of the contemplated voyage, and that if the contemplated voyage involves different stages, there must be fitness for each stage.

Barge Held Unseaworthy

Both the trial court and the Court of Appeal held in favor of the plaintiffs, deciding that there was an obligation on the bargeowner to provide a vessel when the various stages of the contract of employment were entered upon which should be fit and seaworthy for the work to be done.

"Here the contract was to collect and carry," says the Court. "After the evidence had been given, it was clearly open to the learned Judge to come to the conclusion that the stage of loading had been completed, and a moment had been reached when the next stage was commenced. Whether that next stage is truly to be described as the stage of laying in the river, or whether it is more accurately to be described as a stage of being towed, seems to me for the present purpose to be comparatively immaterial. The next stage had been begun the moment the loading stage had been completed; and the learned Judge, if I follow his judgment, finds that at the beginning of that stage—not in the midst of some stage, but at the beginning of that stage—this vessel was unseaworthy. In my opinion, he was entitled so to find, and there is no error in law in the conclusion which, upon these facts, he has expressed. I think, therefore, that the appeal of these appellants ought to be dismissed with costs."

This seems to be a rather Spartan manner of treating both the warranty of seaworthiness and the doctrine of proximate cause. One is inclined to sympathize with the appellants' contention that the negligence of the employee was the real and controlling element in the loss. There seems to be an undercurrent of intention, as displayed in the opinion, to limit strictly the exemption contained in the Lighterage Clause. Perhaps such strictness is necessary in a jurisdiction where the Harter Act does not apply.

Trade Literature

The International Nickel Company, New York, has recently issued two bulletins covering their product. Bulletin No. 203, of 12 pages, "The Economic Value of Nickel in Cast Iron," is a resume of the general characteristics of commonly used nickel-bearing cast iron compositions with a number of typical mixtures and a discussion of the saving effect and the difficulties overcome by their substitution for ordinary cast iron.

Bulletin No. 204, of 4 pages, "Effect of Nickel on Machinability of Cast Iron" is a nontechnical explanation of the function of nickel in eliminating chilled edges from light castings and hard skin from heavier cases without impairing the physical properties as is the case when the common elements of cast iron are employed for this purpose.

* * *

Westinghouse Electric and Manufacturing Company, South Philadelphia, Pennsylvania, has recently issued a new and attractive leaflet, No. 20293, on the subject "Geared Turbine Generator Units 75 to 500 Kilowatts for Alternating and Direct Current Operation." These units are especially adapted for excited sets in central stations, or as sources of power in industrial and marine plants. A number of photographs showing the construction of these units are included in the leaflet.

* * *

Rix Compressed Air & Drill Co., 400 Fourth Street, San Francisco, has recently issued Bulletin No. 150-C covering **Rix High Pressure Compressors.** This bulletin outlines and illustrates the latest Rix high pressure auxiliary air compressors for marine and stationary diesel engines. These compressors are designed particularly for auxiliary use for furnishing air for maneuvering tanks in diesel motorships and for filling starting tanks for both marine and stationary engines. The bulletin should be of interest to all diesel engineers and diesel engine designers.

* * *

Worthington Pump and Machinery Corporation, 115 Broadway, New York, has recently issued Bulletin No. S-173 covering the **Worthington Double-Acting Two-Cycle Diesel Engine.** The bulletin covers in complete detail the double-acting, two-cycle diesel engine as developed by this company and is profusely illustrated with diagrams and photographs of the working parts of the engines. Complete figures are given in summary form of shop tests of this type of engine built for the United States Shipping Board. There is a page in this bulletin devoted to a complete list of domestic and foreign offices and plants of the company.

* * *

Commission of Public Docks of the City of Portland, Oregon, has issued **Annual Report for 1926.** This is published in booklet form and is printed on coated stock, with fine half-tone illustrations. The report is given in great detail, and gives a good insight into the commerce of the port and the relation of the port activities to the facilities offered. A number of drawings and tables are used to clarify statements and descriptions. A short history of the establishment of the port, and its aims and potentialities are a part of this booklet.

Growth of the Williams Line

DURING the hectic days of the Klondike Rush, way back in the summer of 1897, a young man named George T. Williams was engaged in running barges down the Yukon River from Bennett to Dawson. This trip of 600 miles was a heart-breaker in those days, but Williams was full of energy and his barges soon established a reputation for fast, safe passages. On one trip he broke all records by negotiating the distance in 4 days 17 hours.

In the fall of 1889, Williams returned to Seattle and, in association with the late John Rosene and the late J. D. Trenholm, formed the Northwestern Steamship Company of that city. By industry and fair dealing, these men built up a steamship operating organization which in a few years owned and successfully operated thirteen steamers. This corporation was later merged into the Alaska Steamship Company.

In 1916 George T. Williams organized the Williams Steamship Company of New York, which operated transatlantic for a few years. In December, 1920, the fleet was put into intercoastal service as the Williams Line, with four steamers, the Willfaro, Willpolo, Willhilo and Willsolo, owned by the line and three steamers under charter. In 1926 these three chartered steamers were withdrawn by their owners to take advantage of the opportunities for high freight rates in the North Atlantic resultant from the British coal strike. The Williams Line then bought three steamers from the United States Shipping Board and named them Willkeno, Willboro, and Willzipo.

Steamer Willpolo loading at Seattle.

Recently the Williams Line purchased three more Shipping Board freighters, which are now being converted to oil-burning steamers. These will bear the names Willbaco, Willwello, Willanglo. This recent acquisition gives the Williams Line a fleet of ten steamers with an aggregate deadweight capacity of about 100,000 tons, making it the third largest intercoastal fleet now operating. A sailing every 10 days will be established, with a transit time of 17½ days New York to San Francisco.

Albert F. Zipf, vice-president of the Williams Steamship Company and Pacific Coast manager, is very optimistic for future business conditions in the intercoastal shipping business. The Line is represented by energetic district managers in the principal Pacific Coast ports. John L. Burnside, a veteran shipping man of the Northwest, is in charge of the Northwest District with offices at Seattle.

The Williams Steamship Company is well connected in New York and throughout the Atlantic Coast, not only with strong agencies and district offices, but with some of the large distributors of western products.

Steamer Willkeno discharging at San Francisco.

American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

ORDER PLACED FOR GOLDEN GATE FERRYBOAT

The Golden Gate Ferry Company of San Francisco has placed an order with the General Engineering & Drydock Company for an additional double-end, diesel-electric ferryboat for their new San Francisco-Berkeley service. This is the first of two new ferryboats proposed by the company.

The new boat will be a sister ship to three just completed; namely, the Golden Bear, Golden Poppy, and Golden Shore, which were fully described in the November, 1926, issue of this magazine. Their principal characteristics are:

Length over-all	240′ 0″
Beam	44′ 0″
Draft	13′ 0″
Speed, loaded, knots	13

The propulsion machinery for the new boat will be the same as for the three above mentioned and will consist of three generating units which supply power to two propulsion motors, one for each end of the boat. Three Ingersoll-Rand diesel engines of 460 brake horsepower will each be direct-connected to a 250-volt generator developing 270 kilowatts at 265 revolutions per minute and a 40-k.w., 125-volt exciter, all supplied by Westinghouse Electric & Manufacturing Company. The propulsion motors will each develop 950 horsepower at 180 revolutions a minute. The Westinghouse variable voltage system of control will be used, whereby all speed control and maneuvering are accomplished by varying the separately excited shunt fields of the main generators.

The new ferryboat will have a capacity of 350 passengers and 85 automobiles.

WASHINGTON IRON WORKS OBTAINS ORDER FOR AUXILIARY ENGINES FOR COAST GUARD CUTTERS

The United States Coast Guard Service has placed an order with the Washington Iron Works of Seattle for five sets of Washington-Estep diesel engines and equipment for generating auxiliary power on the five new cutters under contract for construction with the Bethlehem Shipbuilding Corporation, Ltd., at Quincy, Massachusetts. The engines will be of the 4-cylinder, 4-cycle, airless injection type, developing 110 brake horsepower each.

This company's diesel engines are used extensively in other branches of state and government activities.

NEW TANK BARGE ORDERED FOR PUGET SOUND

The Wallace Bridge and Structural Steel Company of Seattle is building a bulk oil scow of 3500 barrels' capacity for the Union Oil Company of California. The barge will be constructed to handle four different commodities at the same time and will be used for carrying refined oil from Seattle and Edmonds to various Puget Sound ports.

FUEL TEST EQUIPMENT TO BE INSTALLED

The Maryland Dry Dock Company has received a contract from the Shipping Board for installing burners and distributing equipment for the burning of pulverized coal under boilers. The installation is being made for experimental purposes in the steam freighter Mercer. The vessel is an oil-burning steamer of 9700 tons deadweight. Her propulsion plant consists of a General Electric geared turbine of 2500 horsepower, and three Scotch boilers. The oil burning equipment will be retained on board during the test in case of emergency.

The Mercer will be operated in the north Atlantic trade, following her conversion, to demonstrate the practicability of her equipment for burning pulverized fuel.

The Maryland Dry Dock Company submitted a low bid of $36,498 for the work.

VANCOUVER MAY BUILD A FIREBOAT

The Vancouver (British Columbia) City Council has under consideration a proposal to advance $40,000 towards the construction of a fire-fighting boat for the joint use of which the town of False Creek will contribute $12,000 a year for the next four years.

BIDS ASKED ON TWO NEW LIGHTSHIPS

The United States Lighthouse Service, Washington, D.C., on October 15 will open bids for two new lightships, one of which is to take the place of Lightship No. 70 at San Francisco harbor entrance.

The ships will be 135 feet long, 11 feet draft, of 630 tons displacement. They are to be equipped with diesel-electric power plants, the generators being driven by four 4-cylinder diesel engines. Unusually comfortable accommodations for the officers and crew have been specified, and particular attention has been given to the maintenance and the preparation of the food supply, extra large refrigerating plants making each ship capable of maintaining itself without new supplies for an entire year.

Lightship No. 100 for the Golden Gate station will have a light of 3000 candle power which will be approximately 60 feet above the water and capable of being seen at a distance of thirteen miles. She will be fitted also with a radio beacon besides fog horn and fog bell. These lightships will have special equipment for pouring oil on the water in time of storm.

DUBUQUE BOAT AND MOTOR WORKS SECURES ORDER FOR ADDITIONAL TOWBOAT

The Inland Waterways Corporation, Washington, D.C., has awarded another order to the Dubuque Boat and Boiler Works, Dubuque, Iowa, for a steam tug for the Upper Mississippi River Barge Line. This is the fourth similar tug to be built by this company for the Inland Waterways Corporation, the last contract having been let on a bid of $168,375 and 270 days. The towboat will be 132 feet long, 35 feet beam, 3 feet 6 inches draft, stern wheel, with tandem compound surface condensing engines with Foster steam generator and superheater. The boilers are to be fitted with Coen oil burners.

NEW PASSENGER STEAMERS IN PROSPECT

According to reports from the East, the Iron Steamboat Company of 17 Battery Place, New York, has under consideration plans for the construction of four new passenger vessels to replace some of the present fleet operating for many years in the New York-Coney Island service of this company. Some of the old vessels of the company's fleet were built by Wm. Cramp & Sons Ship & Engine Building Company as far back as 1881.

DREDGE FOR SAN FRANCISCO HARBOR

Chief Engineer White of the Board of State Harbor Commissioners, San Francisco, is working on plans for a dredge for San Francisco Bay. These plans are being worked up leisurely and will not be ready for some time, as the Board considers this a side issue, secondary to its port development work and is simply working up these plans for execution when other port work is not too pressing. Power plant has not been decided upon, but will probably be steam.

CABLE BARGE FOR SAN FRANCISCO

The Pacific Telephone & Telegraph Company, San Francisco, is formulating plans for a cable laying barge for San Francisco Bay. O. R. Cole has charge of this work, but reports that nothing definite will be decided for about thirty days.

NEW SEATTLE FERRYBOAT

Contract has not yet been awarded by the Kitsap County Transportation Company, Seattle, Captain John L. Anderson, president, for the ferryboat which the company plans building for its Seattle-Bainbridge Island service.

The new ferryboat will be 200 feet long, powered with Washington-Estep diesel engines, and will have capacity of 100 passengers and 90 automobiles.

Recent Shipbuilding Contracts

Howard Shipyards & Dock Company, Jeffersonville, Indiana, has an order from The Mengel Company, Louisville, Kentucky, for a derrick boat hull to be 80 feet between perpendiculars, 30 feet beam, and 4 feet 6 inches depth of hold.

This yard also has an order from the U. S. Engineers, St. Louis, for six steel barges to be 100 feet long, 25 feet beam, and 5 feet depth.

An order for two steel barges has been received by the Howard Company from Pine Bluff Sand & Gravel Co., Pine Bluff, Arkansas. These barges will be the same dimensions as those above.

J. C. Johnson's Shipyard, Port Blakely, Washington, reports an order recently received for a self-dumping gravel scow for the Pioneer Sand and Gravel Co., Seattle, to be 100 feet long, 36 feet beam, and 11 feet depth.

Our representative also reports that Mr. Johnson has received a contract from the United States Bureau of Fisheries, Seattle, for a diesel-powered cruiser. This craft is being designed by Coolidge and Hanson, naval architects of Seattle, and will be 90 feet long, 20 feet beam, and 13 feet 5 inches depth. The cruiser will be named Crane. She will be powered with a 200-horsepower Washington-Estep diesel engine.

Midland Barge Company, Midland, Pennsylvania, has an order from E. T. Slider, New Albany, Indiana, for a towboat, 145 by 32 by 5 feet 6 inches.

This yard also has an order for a barge for the Allaconda Copper Company to be 115 by 34 by 10 feet.

Great Lakes Engineer Works, River Rouge, Michigan, has an order from the Great Lakes Dredge & Dock Company for two flat scows; 165 feet long, 42 feet beam, and 14 feet loaded draft.

Nashville Bridge Company, Nashville, Tennessee, has entered a new stock order for a deck barge, 160 feet long, 39 feet beam, and 7 feet loaded draft, keel for which will be laid about November 15.

This yard has also received an order from the Standard Unit Navigation Company for two diesel-electric tugboats, plans for which are not yet completed.

American Bridge Company, Pittsburgh, Penn., has an order for two barges for Anderson & Tully, Memphis, Tenn. The barges will be 160 feet by 34 by 7 feet 6 inches.

The McAteer Shipbuilding Co., Inc., mouth of Duwamish River, Seattle, has an order for a workboat of 38 feet length, 10 feet beam, 4 feet 8 inches draft. Power plant not yet ordered.

Ole Moburg, proprietor of the **Moburg Shipyard,** foot of 20th Street, Seattle, has an order from Hanney & Nelson of Seattle for a halibut schooner to be powered with a Washington-Estep diesel engine.

Ebler Bros. & Armstrong of Seattle have purchased a 180-horsepower Washington-Estep diesel engine from the Washington Iron Works, Seattle, for installation in the halibut schooner Chelsea. Two similar engines will be installed in the seiner Marie Jane for Captain John Gabelich of San Pedro, and in the 78-foot fishing boat building by **Joe Martinac, Tacoma.**

M. Johnson, shipbuilder of Tacoma, has an order for a 70-foot halibut schooner for Captain Berger Edwards of Seattle, to be powered with two 135-horsepower Washington - Estep diesel engines.

N. J. Blanchard Boat Co. has an order from John Scott, Seattle, for an 88-foot yacht to be powered with a 200-horsepower Foos diesel engine. Two Foos diesel engines of 145-horsepower each, will be installed in a new cruiser building for Professor Graf of Seattle. These units were supplied by Garvey & Palmer's Seattle office.

The Pusey and Jones Corp., Wilmington, Del., has an order for a steel twin screw diesel yacht for Samuel A. Salvage of New York. The yacht will be 150 ft. over-all; 22 ft. beam; 7 ft. 6 in. loaded draft. She will have two Winton engines of 600 horsepower each, giving her a speed of 18 miles an hour.

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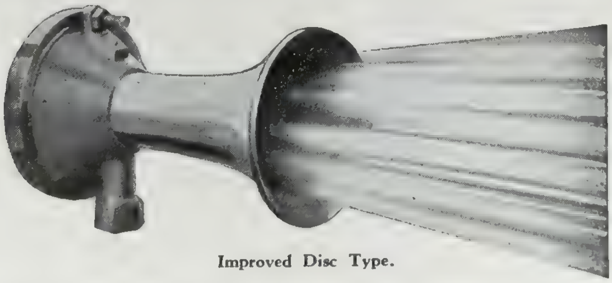

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Contracts for Eight Diesel Engines

The award of contracts for the construction of eight diesel engines for installation in Shipping Board cargo vessels was announced September 19 by Chairman T. V. O'Connor, of the Board. Contracts for the construction of these engines have been awarded to four different companies and the time which will be required for completion of the engines will be approximately 185 days.

The ships to be converted to motor ships under this program have not been selected, but action to this end will be taken at some time prior to completion of the engines. The contracts which have been awarded are as follows:

(1) With the Busch-Sulzer Bros. Diesel Engine Company of St. Louis, Mo., for two 3950 B.H.P., 2-cycle, single-acting, internal combustion engines, with 2 Elliot scavenging blowers, for the price of $584,600 for both engines.

(2) With the Hooven, Owens, Rentschler Co. of Hamilton, Ohio, for two 4000 B.H.P., 2-cycle, double-acting, internal combustion engines, with two A. B. & B. Corporation scavenging blowers, for the price of $592,000 for both engines.

(3) With McIntosh & Seymour Corp. of Auburn, N.Y., for two 3900 B.H.P., 4-cycle, double-acting, internal combustion engines, with "longest piston and most piston rings," for the price of $577,200 for both engines.

(4) With the Worthington Pump & Machinery Corp. of New York, N.Y., for two 3625 B.H.P., 2-cycle, double-acting, internal combustion engines, with 2 Elliott scavenging blowers, for the price of $536,500 for both engines.

REPAIR AWARDS

Los Angeles Shipbuilding & Drydock Corporation is converting the yacht Sultana from a coal to an oil burner, together with overhaul and other repairs. The yacht is owned by the John B. Mills Organization, Inc.

The Moore Dry Dock Company was awarded contract for repairs to the steamer Chas. H. Cramp of the Argonaut Line, which sustained serious hull damage on August 17 when she went aground near Yaquina Head en route to Portland. A low bid of $119,500 and 45 days was made by The Moore Dry Dock Company. Temporary repairs were made at Portland and the vessel was towed to Oakland; 107 of the vessel's bottom plates will have to be replaced or faired.

Mare Island Navy Yard is performing repairs to the U.S.A. transport Cambrai amounting to $36,000.

Crowley Launch & Tugboat Company of San Francisco submitted high bid for $4250 for the old lighthouse tender Madrona. In the event the vessel is awarded to Crowley she will be converted into a seagoing tug.

Yarrows, Ltd., Esquimalt, British Columbia, will perform repairs to the Canadian Pacific Steamship Princess Charlotte, which was seriously damaged by running aground in Alaskan waters the latter part of August. Repairs will cost between $50,000 and $60,000.

Burrard Dry Dock Company, North Vancouver, received contract for repairs to the Canadian National Railways liner Prince Rupert, which ran ashore and broke her rudder in Seymour Narrows. Work will consist of replacing 15 plates, the installation of a new rudder and rudder stock, and renewal of floors and frames, besides engine repairs. Cost will be about $70,000.

LAUNCHINGS

Carfloat for Pennsylvania Railroad by American Brown Boveri Electric Corp., August 27.

Sand Merchant, sand carrier for Interlake Transportation Co., Ltd., Montreal, by Collingwood Shipyards, Ltd., August 17.

One dredge hull for River Sand Co. by Midland Barge Co., August 27; two cabin barges for Inland Waterways Corp., Aug.

Three deck barges for stock, by Nashville Bridge Co., August 25.

DELIVERIES

El Mistico, yacht for E. Michelsen, Seattle, by Ballard Marine Railway Co., Inc., Sept. 1.

Carfloat for Pennsylvania Railroad by American Brown Boveri Electric Corp., Aug.

Weber, river towboat for Upper Mississippi River Barge Line Co. & Inland Waterways Corp., by Dubuque Boat and Boiler Works, July 27.

Carfloat for Lehigh Valley Railroad by Federal Shipbuilding & Drydock Co., Aug. 15.

S. T. Crapo, bulk cement freighter for Huron Transportation Co. by Great Lakes Engineering Works, Aug. 17.

Twenty steel barges for U. S. Army Engineers, St. Louis, during July and August by Howard Shipyards & Dock Company; derrick boat hull for Mengel Co., Louisville, Sept. 2.

Wharf boat each to Dubuque, Minneapolis, and St. Paul by Marietta Manufacturing Co., July 21, 23 and August 30.

Caracas, passenger and freight steamer for Red D. Line. New York, by Newport News Shipbuilding and Dry Dock Co., Aug. 27.

Socony 5, steam tug for Standard Transportation Co. by Staten Island Shipbuilding Co., Aug. 15.

B. F. Affleck, freighter to Pittsburgh Steamship Company by Toledo Shipbuilding Co., Aug. 27.

CONSOLIDATION ANNOUNCEMENT

THE Berry E. Dunn Company, for many years agent in San Francisco for manufacturing interests has been consolidated with a new and larger company and will have shop facilities for bending, electric welding, and testing ammonia and carbon dioxide pipe coils, with increased stock of supplies that will take care of all the needs of ice making and refrigerating plants. Experienced engineers and mechanics will be always on hand for repair and service work.

The new company is incorporated as the Pacific Ice Machine Company, with main office, shop, and warehouse at 832-838 Folsom Street, San Francisco.

Brunswick-Kroeschell Company, manufacturers of ammonia and carbon dioxide refrigerating machinery, with factories in New Brunswick and Chicago, are pleased to announce the appointment of the newly organized Pacific Ice Machine Company as their sales and engineering representatives for northern and central California and Nevada.

Progress of Construction

An Accurate Summary of Ship Construction Work in Progress at the Leading American Shipyards, Showing Keel Layings, Launchings, and Deliveries.

Pacific Coast

BALLARD MARINE RAILWAY CO., INC.,

Seattle, Wash.

El Mistico, hull J 89, yacht for E. Michelsen, Seattle; 44 L.B.P.; 40 H.P. Fairbanks Morse diesel eng.; **delivered Sept. 1/27.**

BETHLEHEM SHIPBUILDING CORPORATION, LTD,. UNION PLANT

Potrero Works, San Francisco

Purchasing Agent: O. W. Streett.

Steel dredge hull for U.S. Smelting, Refining & Mining Co., Oakland, Calif.; 128x60x12 ft.; 10 cu. ft. buckets.

Two steel dredge hulls, sisters to above; 148x60x12 ft.; 10 cu. ft. buckets.

Steel dredge hull, sister to above; 168x60x12 ft.; 10 cu. ft. buckets.

Three steel dredge hulls, sisters to above, 100x50x11'4"; 6 cu. ft. buckets.

Not named, hull 5335, twin screw passenger and freight vessel for Inter-Island Steam Navigation Co., Ltd., Honolulu; 295' L.B.P.; 48' beam; 17'4½" loaded draft; 15 knots loaded speed; 1800 D.W.T.; Westinghouse complete expansion geared turbines and electric motors; 400 S.H.P.; 4 Babcock & Wilcox water-tube boilers; 12,268 sq. ft. heating surface.

GENERAL ENGINEERING & DRYDOCK CO.,

Alameda, California

Purchasing Agent: Al. Wanner.

Hulls 7-11 inc., 5 wooden gravel barges for Pacific Portland Cement Co.; 106 L.B.P.; 32 beam; 9'4" depth.

J. C. JOHNSON'S SHIPYARD

Port Blakely, Wn.

Hulls 120-121, two scows for stock; 100x36x8'8"; launched June 21 and 24/27.

Hull 124, self-dumping gravel scow for Pioneer Sand and Gravel Co., Seattle; 100x36x11 ft.

THE MOORE DRY DOCK COMPANY

Oakland, California

Secretary and Purchasing Agent, Nat Levy.

Hull 174, steel carfloat for Southern Pacific Co.; 258 by 38 by 7'9" loaded draft; 14 cars capacity; keel June 20/27.

PACIFIC COAST ENGINEERING CO.,

Oakland, Calif.

Alki, hull No. 4, fireboat for City of Seattle; 123 L.O.A.; 26 moulded beam, 7'6" draft; 14 knots speed; seven 6-cyl. 300-H.P. Winton diesel engs.; keel July 7/27.

R. W. Atkinson, hull No. 5, dipper dredge hull for Hawaiian Dredging Co., Honolulu; launched June 30/27; deliver Sept. 24/27 est.

U. S. NAVY YARD,

Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY

Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Fifteen covered barges for Inland Waterways Corp., Washington, D.C.; 126'x33'x7'6".

Two barges for Anderson & Tully, Memphis, Tenn.; 160x34x7'6".

Twelve barges for Tennessee Coal, Iron and Railway Co., Birmingham, Ala.; 140x25x11ft.

AMERICAN BROWN-BOVERI ELECTRIC CORP.,

Camden, N. J.

Purchasing Agent: L. G. Buckwalter.

Hull 371, carfloat for Pennsylvania R.R. Co.; 185'x34'x9'6"; keel June/27; **launched Aug. 27/27; delivered Aug./27.**

Hull 372, same as above; keel June/27; launched Aug. 27/27; deliver Sept./27 est.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; deliver July 9/29 est.

Not named, light cruiser CL- 27 for United States Navy, 10,000 tons displacement; deliver June 13/30 est.

THE AMERICAN SHIP BUILDING COMPANY,

Cleveland, Ohio.

Purchasing Agent, C. H. Hirsching.

Harry Coulby, hull 798, bulk freighter for Pickands, Mather Co.; 607' L.B.P.; 65' beam; 33' loaded draft; 13 mi. speed; 13,800 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 B. & W. boilers; 200 lbs. pressure; keel Feb. 7/27; launched April 30/27.

Not named, hull 800, bulk oil barge for Standard Transportation Co.; 258 L.B.P.; 40 beam; 10 draft; keel Mar. 21/27 est.; launch Aug. 7/27 est; deliver Aug. 15/27 est.

Not named, hull 801, oil barge for Standard Transportation Co., sister to above; keel March 21/27; launch Aug. 7/27 est.; deliver Aug. 15/27 est.

Not named, hull 802, tank steamer for Standard Oil Co. (Indiana); 373 L.B.P.;

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52 beam; 20 loaded draft; 12 mi. loaded speed; 6200 D.W.T.; 1800 I.H.P. triple expansion engs., 2 Scotch boilers, 15'x4½"x11'6"x180 lbs. pressure.

Not named, hull 803 motor tanker Roxana Pet. Corp., St. Louis; 334 L.B.P.; 51 beam; 18 loaded draft; 11½ mi. loaded speed; 3700 D.W.T.; 1900 I.H.P. Werkspoor diesel engs.; aux. Scotch boiler.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT,

Quincy, Mass.

Lexington, hull 1300, airplane carrier U. S. N., launched Oct. 3/25.

Hull 1408, oil tank barge for the Cities Service Refining Co.; 150 ft.; 7000 bbls. capacity.

No. 45, electric cutter for U. S. Coast Guard Service; 250x42x15 ft.; Westinghouse turbines and motors; 3000 S.H.P.

No. 46, sister to above.

No. 47, sister to above.

No. 48, sister to above.

No. 49, sister to above.

COLLINGWOOD SHIPYARDS, LTD.

Collingwood, Ontario

Purchasing Agent: E. Podmore.

Sand Merchant, hull 79, sand carrier for Interlake Transportation Co., Ltd., Montreal; 252 L.B.P.; 43'6" beam; 2200 D.W.T. on 14' draft; T.E. engs., 700 I.H.P., 2 Scotch boilers, 13' diam.; keel Apr. 28/27; **launched Aug. 17/27.**

CONSOLIDATED SHIPBUILDING CORPORATION

Morris Heights, N. Y.

Hull 2872, cruiser for B. H. Borden, 95 x16 ft.; 2 Model R Speedway engs., 300 H.P. each.

Hull 2874, cruiser for Clifford V. Brokaw; 85x14ft. 6in.; 2 Model R. Speedway engs., 300 H.P. each.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.,

Philadelphia, Pa.

Purchasing Agent: John A. Budd.

Malolo, hull 509, express psgr. and frt. liner, Matson Navigation Co.; 582 L.O.A.; 577 length at water line; 83 ft. beam; depth molded to C deck 54 ft.; displacement 22,050 tons; 8250 DWT; speed 22 knots regular; 23 knots maximum; 25,000 shaft horsepower; Cramp-Parsons turbines; oil burning B. & W. water tube boilers; keel May 4/25; launched June 26/26; deliver Oct. 27/27 est.

Evangeline, hull 524, twin screw passenger and freight steamer for Eastern Steamship Lines; 378 length at water line; 55'6" beam; 29'6" molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears; 6 single-ended Scotch boilers; keel May 1/26; launched February 12/27; deliver Oct. 1/27 est.

DEFOE BOAT & MOTOR WORKS,

Bay City, Mich.

Purchasing Agent: G. O. Williams.

Comoco, hull 122, steel yacht for R. W. Judson, Detroit; 140' L.B.P.; 23'6" beam; 8'9" loaded draft; 15 mi. speed; 260 D.W.T.; 600 I.H.P. diesel engines; keel Dec. 15/26; launch May 21/27 est; **delivered July 1/27.**

Grathea II., hull 124, yacht for E. T. Strong, Flint, Mich.; 57'x13'x4'; 13 mi. loaded speed; 22 D.W.T.; 200 I.H.P. gas **engs.; keel Aug. 1/27;** launch and deliver Apr. 1/28 est.

Not named, hull 123, steel yacht, owner not named; 105 L.B.P.; 17 beam; 6 loaded draft; 13 loaded speed; 110 D.W.T.; 120 I.H.P. diesel eng.; keel July 11/27; launch Apr. 15/28 est; deliver June 1/27 est.

DRAVO CONTRACTING COMPANY,

Pittsburgh, Pa.

Hulls 588-590 inc., 3 standard steel barges for stock; 100x26x6 ft. 6in.; 135 gro. tons each .

Hulls 591-600 inc., 10 standard steel barges for stock, 100x26x6ft. 6in.; 135 gross tons each.

Hulls 602-604 inc., 3 steel barges for Keystone Sand & Supply Co.; 135x27x 8ft.; 320 gr. tons each.

Hulls 605-612 inc., 8 steel barges for Keystone Sand & Supply Co., 135x27x8ft.; 320 gr. tons each.

Hull 613, steam dredge for stock; 120'x 32'x6'; 200 gr. tons each.

Hulls 615 and 616, two 120-H.P. stern wheel diesel towboats for stock; 74ft. 2in. x16ft. x 4ft.; 320 gro. tons each.

Hulls 621-626 inc., six covered oil barges, steel decks, for International Petroleum Co., Montreal; 100'x30'x6'6"; 180 gross tons each.

Hulls 632-634 inc., three complete maneuver hulls for U. S. Engineers, Pittsburgh, 93 gro. tons each.

Hulls 635-644 inc., ten covered steel barges for Inland Waterways Corp., Washington, D.C.; 126x33x7'6"; 485 gro. tons each.

Hulls 652-653, two steel deck scows for U.S. Engineer Office, Philadelphia; 102x30 x10 ft.; 400 gro. tons each.

DUBUQUE BOAT & BOILER WORKS

Dubuque, Iowa

Purchasing Agent, A. L. Yehger.

Weber, river towboat for Upper Mississippi Barge Line Co. and Inland Waterways Corp.; 132'x35'x3'6"; stern wheel, tandem comp. surface condensing engs.; 15"x30"x78" stroke; **delivered July /27.**

FEDERAL SHIPBUILDING & DRY DOCK COMPANY

Kearny, N. J.

Purchasing Agent, R. S. Page.

Dixie, hull 89, passenger and freight steamer for Southern Pacific Steamship Lines, Pier 49, North River, New York; 427 L.B.P.; 60 beam; 25'6" loaded draft; 6700 D.W.T.; De Laval steam turbines; 7700 S.H.P.; 4 B. & W. boilers, 21,900 sq. ft. heating surface; 16,000 sq. ft. super-

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heating surface; keel Jan. 31/27; launched July 29/27.

Hull 91, carfloat for Lehigh Valley Railroad 278x39x10 ft.; keel May 10/27; **launched Aug. 13/27; delivered Aug. 15/27.**

Hull 92, same as above; keel June 6/27.

Hull 93, carfloat for D. L. & W. Railroad, 278x39x10ft.; keel June 20/27.

Hull 94, same as above; keel July 21/27.

Hull 95, same as above; **keel Aug. 22/27.**

Hull 96, carfloat for the Pennsylvania Railroad; 250x34x9 ft.; **keel Aug. 8/27.**

Hull 97, carfloat, sister to above.

Hull 98, carfloat, sister to above.

Hull 99, carfloat, sister to above.

GREAT LAKES ENGINEERING WORKS,
River Rouge, Mich.

Purchasing Agent: Chas. Short.

S. T. Crapo, hull 256, bulk cement freighter for Huron Transportation Co.; 385 L.B.P.; 60 beam; 19 loaded draft; 11 mi. speed; 7200 D.W.T.; T.E. engs.; 1800 I.H.P.; 3 Scotch boilers; 12ft. 9in. diam.; keel April 1227; launched July 7/27; **delivered Aug. 17/27.**

Hull 258, flat scow for Great Lakes Dredge & Dock Co., 165 x 42 x 12 ft.

Hull 259, flat scow, same as above.

HOWARD SHIPYARDS & DOCK COMPANY,
Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hull 1601, hull for Baton Rouge Car Terminal, Baton Rouge, La.; 285'x60'x9'6"; keel March 30/27; launched July 9/27; deliver Oct. 5/27 est.

Hull 1605, steel barge for U. S. Army Engineers, St. Louis; 55x16x3ft.; keel May 3/27; **launched and delivered July 19/27.**

Hulls 1606-1609, same as above; **launched and delivered July 20/27.**

Hulls 1610-1616, same as above; **launched and delivered July 21, 25 and 28/27.**

Hulls 1617-1624, same as above; **launched and delivered Aug. 19 and 19/27.**

Hull 1625, derrick boat hull for the Mengel Co., Louisville, Ky.; 80 L.B.P.; 30 beam; 4'6" hold; **keel Aug. 17/27; launched Sept. 1/27; delivered Sept. 2/27.**

Hull 1627, steel barge for U. S. Engineers, St. Louis, Mo.; 100x25x5 ft.

Hull 1628, same as above.

Hull 1629, same as above.

Hull 1630, same as above.

Hull 1631, same as above.

Hull 1632, same as above.

Hull 1633, steel barge for Pine Bluff Sand and Gravel Co., Pine Bluff, Ark.; 100x25x5ft.

Hull 1634, same as above.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Purchasing Agent, H. Meyer.

Not named, hull 234, river car ferry for Pere Marquette Railway Co.; 400 L.O.A.; 53 beam; 22 depth; 4 P.M. boilers; two 3-cyl. comp. engs.; launch Sept. 15/27 est.; deliver Nov./27 est.

MARIETTA MANUFACTURING COMPANY
Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Wharf boat for city of Dubuque, Iowa; 214x45x6ft. 6in.; keel May 11/27; **launched and delivered July 21/27.**

Wharf boat for Minneapolis, 214x45x6ft. 6in.; keel May 26/27; **launched and delivered July 23/27.**

Wharf boat for St. Paul, 214x45x6ft. 6in.; keel May 30/27; **launched and delivered Aug. 30/27.**

Stern-wheel towboat for Magdalena River, Colombia; 168x42x5 ft.; keel Aug. 4/27; launch Sept. 30/27 est.

Stern wheel tugboat for Magdalena River, Colombia; 173x44x5ft. 6in.; **keel Sept. 1/27;** launch Nov. 15/27 est.

Stern wheel towboat for Magdalena River, Colombia; 168x42x5ft.; keel Nov. 1/27 est.

Eight steel hoppered cargo barges for Magdalena River, Colombia; 125x26x6 ft.

View of steamship Shawnee at launching. The vessel was delivered to her owners by the Newport News Shipbuilding & Drydock Co. on July 31. Note bulbous bow construction.

MIDLAND BARGE COMPANY
Midland, Pa.

One dredge hull for River Sand Co.: 131x30x5ft.; **launched.**

Four sectional dry docks for International Petroleum Co. of Montreal; 70x44ft.; **one section launched.**

One steel flush deck barge for Dillman Egg Case Co.; 180x36x7 ft.

Fifteen cabin barges for Inland Waterways Corp., Washington, D. C.; 126x33x7ft. 6in.; **2 launched; 3 addl. keels laid.**

Five barges for Inland Waterways Corp., 126'x33'/x7'6".

Not named, towboat for E. T. Slider, New Albany, Ind.; 145x32x5ft. 6in.

One barge for Anaconda Copper Mining Co.; 115x34x10 ft.

NASHVILLE BRIDGE COMPANY,
Nashville, Tenn.

Purchasing Agent, Leo. E. Wege.

Hull 108, dredge, McWilliam Dredging Co., clam shell bucket type; 110'x51'6"x8'; steam eng.; keel July 10/27; launch Sept. 1/27 est.

Hull 121, deck barge for stock; 140 L.B.P.; 32 beam; 6 loaded draft; keel June 15/27; launched July 22/27; **delivered August 8/27.**

Hull 122, deck barge, same as above; keel June 15/27; launched July 27/27; **delivered Aug. 8/27.**

Hull 123, deck barge, same as above; keel June 15/27; launched August 6/27; **delivered Aug. 8/27.**

Hulls 124-127 inc., four deck barges for stock; 130x32x8ft.; keels July 25/27; Aug. 5/27; Aug. 15/27; **launched Aug. 23/27.**

Hull 128, steel steamboat hull, owner not named; 96 L.B.P.; 24 beam; 4 loaded draft; **keel Aug. 18/27.**

Hull 129, steel deck barge; 100x24x5ft.; **keel Aug. 15/27.**

Hull 130, same as above; **keel Aug. 15/27.**

Hull 132, deck barge, for stock; 100 L.B.P.; 24 beam; 5 loaded draft; **keel Aug. 25/27.**

Hull 133, deck barge for stock; 160x39x7 ft.; keel Nov. 15/27 est.; launch Dec. 15/27 est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

California, hull 315, 18-knot, passenger liner for Panama Pacific Line, New York; 600 ft. long, 80 ft. beam, 52 ft. depth; water tube boilers for oil burning, 22,000 gro. tons; 17,000 I.H.P.; keel Mar. 20/26; launch Oct. 1/27 est.

Caracas, hull 319, passenger and freight steamer for Red D Line, New York; 335'4"

Portability

Repair jobs do not respect convenience. On one side of the plant there is a steam leak that must be stopped quickly by oxwelding. Or, a machine breaks on the other side of the plant. Again a hurry call for the welder. Time after time oxwelding equipment must be transported with speed.

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DISSOLVED ACETYLENE

L.O.A.; 51′ beam; 22′ draft; Newport News turbines and gears; water-tube boilers; 3560 D.W.T.; 4000 S.H.P.; keel Nov. 18/26; launched June 30/27; **delivered Aug. 27/27**

Hull 321, barge for Merritt, Chapman and Scott Corp.; 154x50x13ft.; launch Sept. /27 est.; deliver Sept./27 est.

Not named, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; deliver June 13/30 est.

Not named, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement; deliver Mar. 13/31 est.

Not named, hull 325, bay steamer for Chesapeake Steamship Co.; 277′ long, 53′ beam, 18′ depth; 2700 I.H.P.; 4-cyl. T. E. eng.; coal burning Scotch boilers; keel Oct. /27 est.

Not named, hull 326, 18-knot express passenger liner for Panama Pacific Line; 613′3″ L.O.A.; 80′ beam; 52′ depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Nov./27 est.

THE PUSEY & JONES CORP.,

Wilmington, Del.

Purchasing Agent: James Bradford.

Not named, hull 1034, steel twin-screw diesel yacht for Richard Cadwalader, Jr., Philadelphia; Henry J. Gielow, Inc., naval architect, New York; 294′ L.O.A.; 38′3″ beam; 16′ loaded draft; 2 Bessemer diesel engs.; total of 3000 H.P.; keel Apr. 1/27; launch Sept. 12/27 est.; deliver Jan. 1/28 est.

Not named, hull 1035, night passenger and freight vessel for Baltimore Steam Packet Co., Baltimore, Md.; 320 L.B.P.; 56′6″ beam; 15′6″ loaded draft aft; 18½ mi. speed; 1784 gross tons; 2600 I.H.P., 4-cyl. triple expansion engs.; 4 Scotch boilers, 13′8″ diameter.

Not named, hull 1036, steel twin screw diesel yacht for Samuel A. Salvage, New York; 150 L.O.A.; 139′9″ L.W.L.; 22 beam; 7′6″ loaded draft; 18 miles speed; 246 D.W.T.; 2 Winton diesel engines; 600 H.P. each; keel Oct. 15/27 est.; launch Jan. 15/28 est.; deliver May 1/28 est.

STATEN ISLAND SHIPBUILDING COMPANY

Mariner's Harbor, N. Y.

Purchasing agent: R. C. Miller.

Socony 5, hull 774, steam tug for Standard Transportation Co.; 100 ft. 2 in. L. B. P.; 24ft. 1in. beam; 12ft. 3in. depth; 15 knots speed; comp. engs. 850 I.H.P.; 1 Scotch boiler 14ft. 9in. dia. by 12ft.; keel March 15/27; launched June 7/27; **delivered August 15/27.**

SUN SHIPBUILDING COMPANY

Chester, Penn.

Purchasing Agent: H. W. Scott.

Axtell J. Byles, hull 104, single screw bulk oil steamer for Tidewater Oil Co.; 480′ long; 65′9″ beam, 37 feet depth, to carry 13,000 tons on 27′6″ draft; speed 11½ knots; keel March 1/27; launched June 11/27; deliver Oct. 1/27 est.

Colonial Beacon, hull 105, motor barge for Beacon Oil Co., Boston; 255′6″x40′x15′; two 360 H.P. Fairbanks-Morse diesel eng.; keel laid Mar. 7/27; **launched June 11/27; delivered June 29/27.**

Not named, hull 106, motor tanker for Sun Oil Co.; 480′ x 65′9″ x 37′; 13,000 D.W.T.; 2800 S.H.P. at 80 R. P. M.; 4-cyl., 2-cycle Sun Doxford engs.; keel May 2/27.

Not named, hull 107, tanker for California Petroleum Co.; 510′x70′x40′; 17,000 D.W.T.; 4500 S.H.P. at 82 R.P.M., 8-cyl., 2-cycle Sun-Doxford eng.; keel July 5/27.

Hull 108, carfloat for Pennsylvania Railroad; 330′x38′x10′6″; keel June 30/27.

Hull 109, same as above; keel June 30/27.

TOLEDO SHIPBUILDING CO.

Toledo, Ohio.

Purchasing Agent: Otto Hall.

B. F. Affleck, freighter, hull 178, for Pittsburgh Steamship Co.; 580 L.B.P.; 60′ beam; 19′ loaded draft; 12½ mi. speed; 12,500 D.W.T.; T.E. engs.; 2500 I.H.P.; 3 Scotch boilers; 14′ diam.; keel Feb. 1/27; launched June 25/27; **delivered Aug. 27/27.**

TODD DRYDOCK, ENGINEERING, & REPAIR CORP.

Brooklyn, N. Y.

Purchasing Agent: H. J. Shannon.

Greenwich Village, hull 40, diesel-electric ferryboat for Dept. of Plant & Structures, City of New York; 101 ft. 6 in. length over guards; 27 ft. 7 in. beam; 6 ft. 8¾ in. loaded draft; 300 I.H.P. Nelseco diesel engine; keel Apr. 14/27; launched July 19/27.

Mott Haven, hull 41, diesel-electric ferryboat, sister to above; keel Apr. 14/27; launched July 19/27.

THE CHARLES WARD ENGINEERING WORKS

Charleston, W. Va.

Purchasing Agent: E. T. Jones.

F. H. Hilliard, hull 62, diesel powered stern wheel survey boat for Mississippi River Comm., Dredging Dist., Memphis, Tenn.; 139′6″x24′x5′3″; keel June 2/27.

Not named, hull 63, steel hull diesel-electric stern wheel towboat for U.S. Engineers, St. Louis; 110x23x5 ft.

General Humphreys, hull 64, steel hull inspection boat for U. S. Engineers, New Orleans; 85x18x7ft.; diesel eng.; single screw.

Repairs

BURRARD DRYDOCK AND SHIPYARDS,

North Vancouver, B.C.

Extensive bottom and engine damage repairs: steamship Prince Rupert. New spanker mast and general repairs: schooner Malahat.

CHARLESTON DRYDOCK AND MACHINE CO.,

Charleston, S.C.

Purchasing Agent: Charles R. Valk.

Drydocking, cleaning, painting, and minor repairs; U.S.C.G. cutter Modoc. Repairs to boilers, fire damage repairs, renew damaged plates, dock, clean, paint: stmr. Oakman. New decks and general overhaul: Tug Hinton.

CRAIG SHIPBUILDING COMPANY,

Long Beach, Calif.

Clean and paint: m.s. Patsy, stmr. Olympic, Skagway, barge Pastime, yacht Los Ceritos, tug J. F. Craig, dredge Seattle. Remove masts: schr. Thos. P. Emigh.

GENERAL ENGINEERING & DRY DOCK COMPANY,

Alameda, Calif.

Drydock, clean, paint, minor repairs: gas s. Phoenix, barge Orca, schr. Catherine G. Sudden (also remove and reinstall wheel, draw tail shaft for inspection; overhaul sea valves and strainers), gas. s. Harbor (also bored holes for O. B. discharge; burned out worm holes and dubbed off rough places on hull), stmr. Midway (also overhauled sea valves and strainers; repacked stern gland; made rings for circulator; also steam rings for fuel pumps; faced two boiler valves; caulked, misc. rivets), stmr. Willamette (drew tailshaft; caulked butts on hull; removed sea valve; inspected lead sleeve and renewed bronze lag studs on hand deck pump; removed wheel, straightened three blades and reinstalled), stmr. W. R. Chamberlin, Jr.

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATION,

San Pedro, Calif.

Hull repairs: yacht Mariner. Voyage repairs: stmrs. Winifred O'Donnell, Stockton, Warwick, La Purisima, Tecumseh. Shaft alignment: whaler Lorentz Brunn. Clean and paint: Asso. Oil Lighter No. 6, yacht Malibu (reset pitch of propeller), schr. Mindanao, stmr. Mexico (also caulk), stmr. Satanta, yacht Alma (also stop leaks). Check structure: yacht Invader.

U.S. NAVY YARD,

Bremerton, Wash.

Drydock and misc. repairs: California, West Virginia, Kanawha, McCawley, Henshaw, Farragut, William Jones. Dock only: Moody, J. F. Burnes, Somers. Misc. repairs incidental to operation as district craft: Mahopac, Swallow, Challenge, Pawtucket, Sotoyomo, Tatnuck.

PRINCE RUPERT SHIPYARDS

Prince Rupert, B. C.

Docked, cleaned, paint: One scow. Docked, cleaned, painted, misc. hull and machinery repairs: 28 fishing boats. Misc. hull and engine repairs: 42 fishing boats. 60 other commercial jobs.

TODD DRY DOCKS, Inc.,

Seattle, Wash.

Drydock, clean, paint, misc. repairs: stmr. City of Spokane, tug Daniel Kern. ferry City of Tacoma. Misc. engine room repairs: stmr. H. F. Alexander. Extensive overhauling and alterations: stmr. Comfort. Minor engine room repairs: stmr. Fernbank. Docked for survey: stmr. Cascade. Grounding damage repairs: Admiral Watson. Misc. repairs: Admiral Evans, yacht Aquilo, stmr. Cacique, stmr. Remus.

VICTORIA MACHINERY DEPOT CO.,

Victoria, B. C.

Docked for survey, temporary repairs: m.s. Challamba. Docked, cleaned, painted, new tail shaft made and installed: tugs Quintsa, Olive M. (also rudder, propeller and boiler repairs; sheathing on hull and false keel renewed), Squid (also boiler repairs), Edna Grace. Retubed boiler, engine repairs: tug Swell. New tail and shaft: stmr. Canadian Transporter. Dock cleaned, painted: stmr. Princess Mary (also tail and repairs), pile driver scow, m.s. Harriett E2, tug Chehalis (also tail end, hull, and boiler repairs), stmr. Salvage King (also deck repairs), stmr. Salvage Queen (tail end repairs), stmr. Charmer (also tail shaft and hull repairs), Can. Puget Sound Lbr. Co. scow. Docked for survey, temporary repairs: stmr. Princess Maquinna. Boiler repairs: tug Superior, stmr. Forager.

Trade · Shipping · Personals

Trade Winds

A Review of the Trends in Ocean Trade on the Pacific Gleaned from Reports of Pacific Ports Chambers of Commerce

Oriental Trade. Notwithstanding temporary depression in Japan and internal trouble in China, trade of United States with Japan increased 3.4 per cent. in the fiscal year ending June 30, 1927, and that with China increased 5 per cent. as compared with the preceding fiscal year. Total trade of United States with Japan in last fiscal year was $685,520,000. Imports amounted to $418,109,000, a gain of 2.2 per cent., and exports $267,401,000, a gain of 5.2 per cent. Price reduction and volume increase were featured in this rise in total values. Exports in Douglas fir, cedar, and hemlock, for instance, show a decline in price of 11 per cent. and an advance in total value of 20 per cent.

Paper Pulp. From the standpoint of coastwise and intercoastal cargoes, one of the most significant recent developments is the rush of new capital into the paper and pulp industry in the Pacific Northwest. New processes in this industry have made available practically every species of timber growing in Northern California, Oregon, and Washington. Every chemical or mineral necessary to the industry is available close at hand. During the past year $18,000,000 has been invested or authorized for investment in new pulp and paper mills in or near the City of Seattle. In 1926 the United States consumed 3,400,000 tons of news print or 56 per cent. of the world's total production.

The steamship Willpolo of the Williams Line discharging cargo.

Alaska Salmon pack is considerably below average this year. Normally the canned salmon of the Northwest represents a tonnage around 250,000. This year, under government regulation and with the co-operation of the canners, the season was closed early to allow a better spawning season and better perpetuation of the industry. There is much opportunity in the Pacific Northwest for the introduction of methods and processes looking to the utilization of by-products in the fish industry.

Wheat and Grain. The wheat

SUMMARY OF THE
EMPLOYMENT OF AMERICAN STEAM AND MOTOR MERCHANT VESSELS
OF 1,000 GROSS TONS AND OVER
(Does not include Lake or River tonnage)
AS AT JULY 1, 1927.

Report D.S. No.300
Table I

Services	Passenger & Combination.		General Cargo		Tankers		Total	
	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons
PRIVATELY OWNED:								
West Indies & Caribbean	28	124,912	73	210,433	66	398,601	167	733,946
Overseas Foreign	30	332,089	103	549,561	49	332,952	182	1,214,602
Coastwise	103	490,173	455	1,805,662	220	1,410,784	778	3,706,619
Laid up Vessels	19	88,434	64	174,674	14	58,206	97	321,314
Total Privately Owned	180	1,035,608	695	2,740,330	349	2,200,543	1,224	5,976,481
GOVERNMENT OWNED:								
West Indies & Caribbean	*2	19,244	-	-	1	5,189	3	24,433
Overseas Foreign	10	166,542	**280	1,612,574	3	21,650	293	1,800,766
Coastwise	-	-	-	-	5	31,541	5	31,541
Government Service	-	-	1	4,963	-	-	1	4,963
Laid up Vessels	4	68,586	***509	2,503,243	2	11,113	515	2,582,942
Total Government Owned	16	254,372	790	4,120,780	11	69,493	817	4,444,645
Total American Merchant Fleet	196	1,289,980	1,485	6,861,110	360	2,270,036	2,041	10,421,126

* Panama R. R. Vessels.
** Includes 2 Panama R. R. Vessels.
*** Includes 2 Panama R. R. Vessels.

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1 The one line serving Pacific Coast Commerce whose ships call at the principal ports of both North America and South America.

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Pacific Ports to Gulf — Redwood Line

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SAN FRANCISCO—HAVANA—NEW YORK SERVICE
—LOCAL—
MEXICO, CENTRAL AMERICA, PANAMA AND COLOMBIA SERVICE

From San Francisco—Los Angeles			From New York—Cristobal		
*S.S. Venezuela	Oct. 8	Oct. 10	†S.S. Corinto	....	Oct. 7
†M.S. City of S. F.	Oct. 15	Oct. 17	*S.S. Colombia	Oct. 22	Nov. 1
*S.S. Ecuador	Oct. 29	Oct. 31	M.S. City of Panama....	....	Oct 28
†S.S. Corinto	Nov. 12	....	*S.S. Venezuela	Nov. 12	Nov. 22
*S.S. Colombia	Nov. 26	Nov. 28	†M.S. City of S. F. ...	....	Nov. 18

*Ports of Call—Mazatlan, Champerico, San Jose de Guatemala, Acajutla, La Libertad, La Union, Amapala, Corinto, San Juan del Sur, Puntarenas, Balboa and Cristobal.

†Ports of call—Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal and (Havana eastbound only), Cartagena and Puerto Colombia (Westbound only), and New York.

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The new gallery for convenience of passengers and friends at the pier of the Los Angeles Steamship Company, San Francisco.

crop of Pacific Northwest this year will top 110,000,000 bushels and the grain crop of California is larger than last year. Seattle's huge grain terminals are full notwithstanding heavy cargoes constantly moving, mostly in the export trade. Portland, Tacoma, Astoria, Vancouver report similar conditions. Volume records may be broken this year in Pacific Coast grain cargoes.

Fruit. One of the most interesting developments on the Pacific Coast during recent years has been the shipment of refrigerated fresh fruit by water. Cooled and refrigerated shipments of Northwest and California apples and of California citrus fruits are growing rapidly in volume and promise to add large tonnage for intercoastal and European shipping. At the present time the success of shipments of refrigerated deciduous fruits from Pacific Coast to Oriental points is being well-demonstrated by experimental cargoes on the motorships of the Silver Line running from San Francisco to Japan, China, the Philippines, Dutch East Indies, and Singapore. The General Steamship Company, Pacific Coast agents for the line, is co-operating with the Harbor Barge and Towboat Company of San Francisco and with groups of growers and shippers of fruit in sending out to selected individuals and merchants in Oriental ports shipments of fancy plums, peaches, pears, figs, and table grapes, with a questionnaire in each package requesting details as to condition of package and its contents on arrival. One such cargo has already been distributed and very satisfactory reports are coming back. Another cargo is on the way. From the experience gained, standards of packing and stowage will be established, and it is confidently asserted that a new and large market will be opened up for the fresh fruit and vegetable products of the Pacific Coast.

San Francisco Bay passenger traffic is always an interesting study for the statisticians. The report of the supervising inspector of the United States Steamboat Inspection Service for the year ending June 30, 1927, shows the total number of passengers handled as 58,160,861, practically the same as for the previous year. However, there is a great change going on in the several items that go to make up this total. Among the commuters and transient shopping and traveling foot passengers, there is a decrease of over 3,000,000, which is a little more than compensated for by the increase in passengers carried across in automobiles. Of these passengers 55,500,000 repre-

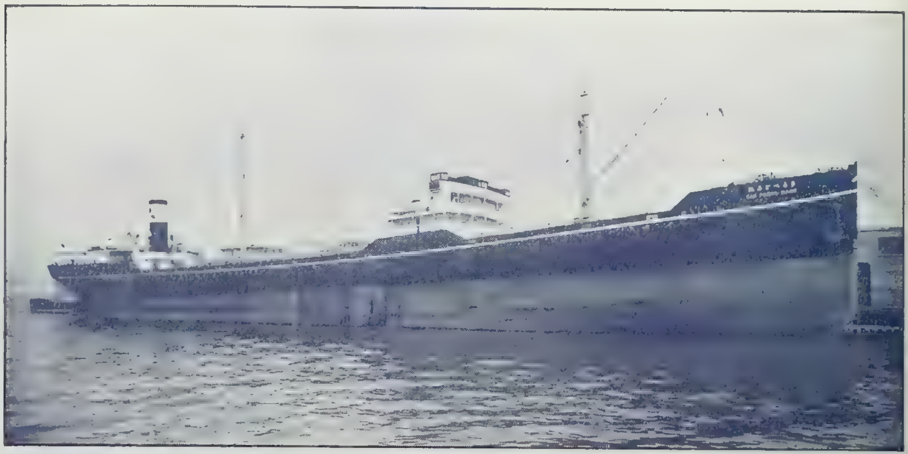
All in the day's work at the General Steamship Company's pier at San Francisco.

sent traffic to and from San Francisco.

Australia continues to evidence a brisk demand for American products, notably automotive products, lumber, iron and steel. During the 1926-27 fiscal year total exports to Australia increased over 12 per cent. and automotive products over 38 per cent. New Zealand showed a similar increase. The Philippine sales of American goods registered a 5 per cent. advance.

Chile's banking system has been reorganized along the lines of the fundamental ideas underlying the United States Federal Reserve Banks by the establishment of the Banco Central del Chile. The new institution opened for business on January 11, 1926, and its operation during that year has completely demonstrated its ability to stabilize the financial structure in Chile. This will undoubtedly lead to a revival of business and of foreign trade in that portion of South America.

Buenaventura, the Pacific port of the Republic of Colombia, has for some months been very badly congested, but is now in a fair way to be cleared up due to large expenditures for piers and other port projects. The Andean plateau of Colombia is using many American manufactured products and machinery, most of which is going forward via Buenaventura.



The Japanese motor tanker San Pedro Maru. Sulzer diesel engines and ship built by Mitsui & Co.

The Calmar Line

OPERATING in conjunction with Moore & McCormack of New York, the Bethlehem Steel Company has entered the intercoastal freight service, naming Swayne & Hoyt, Inc., a pioneer San Francisco shipping firm, as its Pacific Coast agents, and C. W. Cook as its Pacific Coast traffic manager.

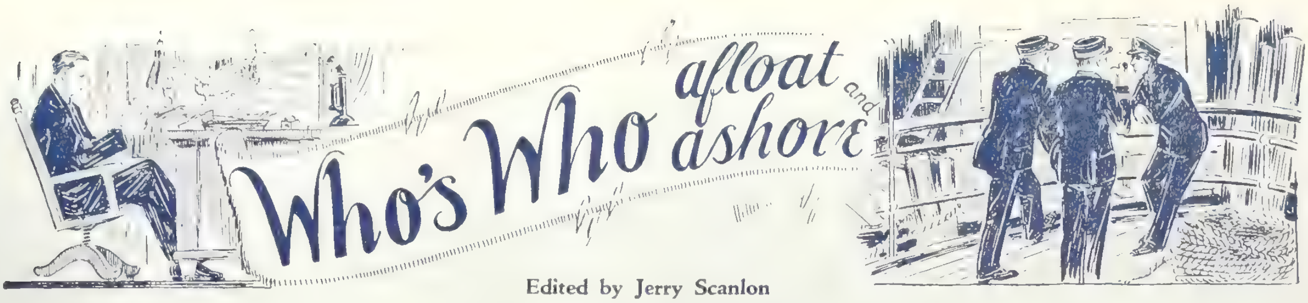
Bethlehem is entering this service with six steamers bought from the Garland Line, four steamers chartered from Moore and McCormack, and two vessels, the motorship Cubore and the steamer Feltore, diverted from the Ore Line of its own subsidiary, the Ore Steamship Company.

The Cubore, initial vessel of the fleet, has now delivered its first cargo of Bethlehem steel at Los Angeles, San Francisco, Portland, and Seattle, and is loading lumber for the return voyage. The steamer Calmar sailed from Philadelphia on September 12. Details and sailing and ports are not yet announced, but it is reported that the schedule calls for a sailing every twelve days.

Swayne & Hoyt, Inc., maintain their own organization and offices at Los Angeles, Seattle, and Portland, as well as the head office at San Francisco and a sub-agency at Vancouver, British Columbia. This wide spread gives them a complete coverage of the Pacific Coast and enables them to give shippers a thorough and unified intercoastal steamship service. They are now, and have been for some years, managing operators for the United States Shipping Board of the American-Australia-Orient Line, with services from San Francisco to and from New Zealand and Australia, and San Francisco to and from Japan, China, the Philippines, and Indo-China. They operate also the Gulf Pacific Line between Pacific Coast ports and Gulf Coast ports.

The ore carrying motorship Cubore of the Ore Steamship Company, subsidiary of the Bethlehem Steel Company. The Cubore is now on the Pacific Coast loading with lumber after discharging Bethlehem steel at Los Angeles, San Francisco, Portland, and Seattle. She is the initial vessel in the intercoastal service of the Calmar Steamship Company, a new subsidiary of the Bethlehem Steel Company.

Who's Who afloat and ashore



Edited by Jerry Scanlon

Captain M. C. Cochrane, late commander of the Dollar liner President Taft.

THE shipping world on both sides of the Pacific and especially in San Francisco was shocked by the death at sea on September 9, of Captain M. C. Cochrane, commander of the Dollar liner President Taft. The mantle of death descended on the popular young transpacific skipper after a short illness, while the vessel was en route from Yokohama to Seattle, three days out of the latter port. Following the passing of Captain Cochrane, Chief Officer H. S. Bauer brought the vessel into port.

Thirty-five years of age, Captain Cochrane was perhaps one of the best loved and respected of the younger generation of men who go down to the sea in ships. For many years Captain Cochrane was with the old Pacific Mail Steamship Company, sailing to the Orient, and also in the intercoastal trade. Messages of condolence from all parts of the world were received by the widow and young son of Captain Cochrane at the family home, San Francisco. A wish expressed by Captain Cochrane, a few days before he passed away, that he be buried at sea was carried out before the vessel, with her flags at half mast, arrived in Seattle. Flags fluttered from the staffs of the Dollar Line at half mast in many world ports, following a radio broadcast of Captain Cochrane's death.

The E. R. Sterling, one of the few six-masted barkentines afloat, was dismasted and otherwise damaged in a hurricane off the African Coast while en route from Adelaide, Australia, to the United Kingdom, grain laden. The craft was towed to Cape Verde Islands by the British freighter Norman Monarch and is undergoing repairs there at Port St. Vincent.

The E. R. Sterling is a well-known vessel along the Pacific Coast, having sailed in and out of these ports for many years, and her owner and skipper, Captain Sterling, is one of the most popular sailing ship masters on the Pacific.

The honor of vice-commodore of the Mariners' League of the Salvation Army has been conferred on Captain Robert Dollar, head of the Dollar Steamship Line and world figure in shipping, by Evangeline Booth, commodore of the international organization.

An inventory of the Merchant Fleet Corporation shows that the war-time body has for disposal shipyards, plants, and housing projects valued at $47,334,157, of which the principal item is Hog Island. The survey resulting in this valuation has been going on for some time and covers stock on hand in its several huge storehouses and was undertaken by the Merchant Fleet Corporation with a view to declaring surplus all nonstandard, excess, or obsolete material, and the inventory will be continued during the coming year.

Using a special deep-sea diving device divers will seek a solution of the mysterious foundering of the tug Bahada last November in 140 feet of water in Puget Sound waters near Saddleback Island. Operations will commence early this month. The Bahada, owned by Gilkey Brothers of Seattle, was lost while bound from Anacortes to Bellingham with a small boom of logs in tow. Nine men of the tug's crew were drowned. At the time of the disaster it was reported the Bahada sunk, following an explosion.

A survey of the Gulf of Panama and the approaches to the Panama Canal from the Pacific Ocean has been started by the United States Government with the U. S. S. Niagara. The work is expected to cover a period of four years. The Niagara will be kept continuously on the surveying work, with the exception of a few months each year when the vessel will be taken to the Philadelphia navy yard for overhauling, and for the plotting of the accumulated survey data.

A royal decree states that start-that starting the first month of January, 1928, the merchant flag of Spain shall be the same as that used by warships, with the exception of the national arms therefrom. The national flag of the merchant marine will be composed of three bands, of which the top and bottom will be of the same width and of red color. The central band will be of yellow and double the width of the red. The present merchant flag of Spain consists of two narrow horizontal red bands on a yellow ground.

"Sammy," the "travellingest" mascot of dogdom and incidentally of the round-the-world liner President Adams, is again riding the high seas in his second round the world voyage. Sammy's position as protector of the ship's master, Captain W. A. Ross, has been somewhat weakened due to the fact that his port foreleg is encased in

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splints as the result of an unpremeditated drop into the hold while the vessel was lying at New York. The canine seafarer was just recovered from a fracture of the starboard forequarter occasioned by being crossed in signals with rickshaw traffic in Kobe. Now his port stanchion is cracked. Captain Ross asserts that the terrier will be confined to rear quarters unless he watches his step.

The erstwhile transport and adventure ship Buford was taken over by agents of the federal government for libel under an order handed down by Judge George M. Borquin. The historic transport was seized in answer to a libel filed by representatives of the government charging that $12,000 was owing on the purchase price. She has been lying off Mission Rock, San Francisco Bay, for three years. She is now in charge of the U. S. Marshal's deputies and will be placed under public sale for a sum sufficient to satisfy the present suit.

The Buford was built in Belfast in 1890. She was used in British freight trade and subsequently acquired by the United States, serving as a troop ship to the Philippines. During the World War she conveyed thousands of troops to Siberia out of San Francisco. She also served as a refugee ship to Mexican waters during a revolutionary period. The Alaska-Siberian Navigation Company acquired the Buford in 1923 for service in Arctic trade routes, and when her usefulness in that direction waned she was manned by a party of prominent San Franciscans and cruised through the South Seas on an adventure trip.

A revised chart showing the recent surveys, improvements, and additions made to San Francisco harbor and the entrance to the Golden Gate has recently been completed, it was announced by Commander Paul C. Whitney, inspector in charge.

Another square-rigger familiar to Pacific Coast ports is doomed to oblivion with the report from Sydney, Australia, that the Chillocothe was purchased by the French Shipping Company to be stripped into a barge. The last voyage of the fourmaster, 114 days out of the Columbia River for Australia, proved too much for the craft. She was badly battered by storms and limped into port long overdue, with food and water low. J. J. Moore & Company, purchasers of the vessel from the Columbia River Packers' Association, found her unseaworthy and sold her for conversion. The Chillicothe was built in 1892 as the German ship Floto.

"Sammy," mascot of the Dollar liner President Adams. With his forefoot in a splint, he is guarded by Captain W. A. Ross, master of the Adams.

J. S. Ryder, official of the United Fruit Company, arrived in San Francisco the middle of September to arrange for the company's passenger and freight steamship service between this port and Central America. Operation of the new line is scheduled to start with the departure of the ship La Union, from Costa Rica, October 25, with arrival at San Francisco, November 10. A terminal for the line is to be built by the Southern Pacific Company at the Channel adjacent to Third street.

Merle V. Johnson, recently appointed port engineer at San Francisco for the Panama Mail Steamship Company

Two employees of the Matson Navigation Company are returning to San Francisco early this month after participating in the American Legion convention in Paris with the California ex-service men. They are Joubert B. Hurd, purser of the steamer Manoa, and Clifford S. Archambault of the freight department.

Merle V. Johnson has taken up his duties as port engineer for the Panama Mail Line at California ports. He was relieved as chief engineer of the liner Ecuador, by first assistant engineer James Smith. John W. Ahumada was elevated from second to first assistant engineer. Johnson's headquarters are at pier 46, San Francisco, and he is in charge of the liners Ecuador, Colombia, Venezuela and Corinto as well as the motorships City of San Francisco and City of Panama.

Harry Heberan, who was formerly first assistant engineer of the transpacific Dollar liner President Taft, is now connected with the General Engineering and Dry Dock Company, Alameda, California, as outside man, working under sales manager Frank Fox, it was announced by George Armes, president. Heberan's duties are along the waterfront where he is well-known and popular with engineers afloat and ashore.

Jerry H. Regan, who sailed the Pacific for many years on Oriental liners of the old Pacific Mail line, sailed from San Francisco with Mrs. Regan aboard the liner Ecuador to spend a vacation in the Maine woods. Regan sailed as a passenger aboard the vessel of which he was formerly chief engineer. He plans to return to San Francisco next month, where he makes his home, following his retirement from the sea.

Starting this month, the Canadian-American Steamship Company contemplates including San Francisco in its United Kingdom-Continent service at present confined to Puget Sound and British Columbia ports on the Pacific Coast.

After a three months' vacation, Captain Samuel Robinson is again in command of the Canadian Pa-

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VANCOUVER SEATTLE PORTLAND
SAN FRANCISCO LOS ANGELES

cific Steamships Line's liner Empress of Canada. During his shoreside stay, Captain Robinson was relieved by Captain A. J. Haley. Captain Haley is now master of the steamer Empress of Asia, while Skipper L. D. Douglas remains ashore for one voyage.

On an inspection tour of the Pacific Coast, John S. Woodruff, navigation officer of the United States Shipping Board, completed his survey, and has returned to Washington to make his report. Early this month, T. V. O'Connor, chairman of the Board, is due to confer with Shipping Board heads on the Pacific Coast, as well as many of the leading officials of privately-owned steamship lines.

William Kyle, second officer of the Panama Mail liner Colombia, was forced to remain ashore at San Francisco when the vessel sailed, due to illness. He is now convalescing and expects to rejoin his ship when the vessel arrives in this port from New York next month.

The Luckenbach Line's westbound vessels from Boston sail on Tuesday instead of Monday, according to a new schedule announced by San Francisco officials. The line's vessels will touch San Francisco on the same days as heretofore, thereby cutting transit time from 28½ to 27½ days.

Captain James F. Higgins, veteran sailing master of the Pacific Coast, passed away at his residence 550 Mandana Boulevard, Oakland, last month following a brief illness. He leaves a widow, Mrs. Emma L. Higgins, a daughter, Mrs. Fred Crowhurst, a son, Cleone Higgins, a sister, Mrs. William Julian, and two brothers. Captain Higgins followed the sea since he was fourteen years old and death came when he was nearly 80. His father, James H. Higgins, a San Francisco shipbuilder, built the Julia H. Ray, the first steam-schooner to be launched on the Pacific Coast.

Organization of the Washington Stevedoring Company at Seattle by W. C. Dawson and E. A. Quigle, was announced recently. Dawson is a veteran Pacific Coast shipping man, while Quigle was formerly vice-president and general manager of the International Stevedoring Company. Both have seen much service in the Pacific Northwest.

Captain Arthur Self, of the Los Angeles Steamship Company's liner City of Honolulu.

Great increase in foreign and American travel during recent years, leading to numerous luggage problems, has resulted in the establishment of The Luggage Information Service. This service was organized by luggage manufacturers to co-operate with steamship companies, tourist agencies, and railways in an effort to overcome some of the perplexities which confront the traveler. One of the aims of the service is to confer with foreign ministries in an effort to facilitate travel abroad.

Sale of the steamer Chamblee, 1394 net tons, to the Showakissen Kabushika Kaisha of Japan, was announced by G. B. McLeod, general manager of the Hammond Lumber Company at Portland. The vessel is to be delivered at Kobe in December. She is one of a number to be sold by this company to Japanese interests.

The Dollar Steamship Company has begun preparations for the Christmas season at this early date with instructions calling for revamped schedules to allow the company's ships to be in port on Christmas day. The President Wilson will have to gain twenty-four hours on her schedule in order to make San Francisco harbor on Christmas day.

For the first time in three years, heads of all departments of the Matson Navigation Company from all ports of the Pacific Coast and the Hawaiian Islands met in San Francisco the middle of last month to attend a Port Superintendent's Conference.

All phases of operation afloat and ashore were discussed during the five days' conference, which was attended by E. D. Tenney, chairman of the board of directors, and William P. Roth, president.

During the stay of the out-of-town Matson officials they were taken on an inspection tour of the Crockett refinery and the piers, the headquarters, and other interests of the Matson Line. It was not all work that the officials participated in, as the San Francisco officers arranged for a picnic, lunches, dinner dances, and theatre parties for the visitors, with Matt Lindsay as master of the entertainment.

Matson Navigation Company officials at luncheon during conference at the company's cafeteria at the Matson terminal, San Francisco. They are, left to right: Captain C. W. Saunders, Captain R. H. Baker, Charles A. Drew, M. F. Cropley, Captain G. M. Goodwin, John Ryan, Irwin Scott, W. M. Gorham, William Walsh, Captain W. F. M. Edwards, J. "Nick" Detlow, Hugh Gallagher, Charles B. Warren, F. A. Bailey, Captain J. W. Bertrand, Matt J. Lindsay, W. D. Gould, and Captain James P. Rasmussen.

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Among those who attended the conference were Captain C. W. Saunders, operating manager; Captain R. H. Baker, port captain at Hilo; Charles A. Drew, manager of the steamship department of Castle & Cooke, Ltd., the Matson Line's Honolulu agency; M. F. Cropley, assistant freight traffic manager, Matson South Seas and Australian Service; Captain G. M. Goodwin, port captain at Kaanapali, Maui; John Ryan, statistician and cost expert of the Matson Line; Irwin Scott, assistant general superintendent; W. M. Gorham, harbor master, Port Allen, Kauai; William Walsh, port captain, Kahului, Maui; Captain W. F. M. Edwards, general superintendent; John (Nick) Detlow, loading foreman; Hugh Gallagher, assistant manager Matson South Seas-Australian Service; Charles V. Warren, assistant manager of Alexander & Baldwin Ltd., Matson Line's Seattle agency; F. A. Bailey, secretary, Matson Navigation Company; Captain J. W. Bertrand, port captain, Ahukini, Kauai; Matt J. Lindsay, freight traffic manager, Matson Navigation Company; W. D. (Bill) Gould, manager of the Matson Terminals Inc., Puget Sound; and Captain J. P. Rasmussen, port captain at Honolulu.

Ralph E. Devinney, San Francisco district manager, California and Eastern Steamship Company.

One of the younger generation of San Francisco steamship executives who is rapidly forging to the front is Ralph E. Devinney, district manager of the California and Eastern Steamship Company. On a recent visit to San Francisco of A. P. Hammond, vice-president and general manager, he complimented Mr. Devinney on his handling of the affairs of the company.

In September of 1924, the California and Eastern Steamship Company started operations with one steamer, the West Montop. A year later they secured the freighter West Keats. Then the steamers West Katon and West Mingo were purchased. This year the company chartered the steamers New Britain and the J. R. Gordon.

Mr. Devinney has been associated with Mr. Hammond for many years, starting with the Luckenbach Steamship Company under Mr. Hammond when the latter served as Pacific Coast manager of that Company. Mr. Devinney is one of the most popular steamship executives in San Francisco, and under his active supervision the duties that come under his jurisdicton have been handled in "shipshape" manner by his capable staff both on the pier and uptown offices.

William P. Roth, president of the Matson Navigation Company, announced that the de luxe liner Malolo, largest, swiftest and most luxurious steamer ever built in an American shipyard, will sail from New York on October 27. She will call at Havana en route via Panama and at Los Angeles harbor, arriving in San Francisco on Armistice Day, November 11.

The day before sailing a dinner will be given in New York to prominent business and social leaders, state and civic officials, steamship executives, and newspaper men. Similar functions will be staged at Los Angeles and San Francisco.

Commodore Peter Johnson will be in command of the Malolo as she sets her course on the intercoastal voyage of fifteen days from New York to San Francisco. The Malolo will sail from San Francisco on November 16, for the Hawaiian Islands, inaugurating the San Francisco-Honolulu express service on a schedule of 4½ days for the 2100-mile voyage. Scheduled to go east this month and make the trip aboard the Malolo from New York are E. D. Tenney, chairman of the board of directors; William P. Roth, president; Captain C. W. Saunders, operating manager; and William H. Sellander, passenger traffic manager.

C. A. Bodmer, first assistant engineer of the Matson liner Lurline, recently claimed as his bride, Miss Bertha Ast. Mr. Bodmer's father, H. E. Bodmer, is a member of the "Matson family," being third assistant engineer of the liner Wilhelmina.

Captain Jack Healy, former chief officer of the Matsonia, is now skipper of the freighter Makaweli of the Matson fleet of freighters.

Beaumont's New Port Director

Shelby Wiggins, new port director at Beaumont, Texas.

ACTING upon the recommendation of its Dock and Wharf Commission, the City of Beaumont has employed Shelby Wiggins, formerly manager of the Foreign Trade Department of the Portland (Oregon) Chamber of Commerce, as Port Director of the Texas city, Mr. Wiggins assuming his new duties on September 1. The City Commission of Beaumont further approved plans for the port development work to be undertaken by Mr. Wiggins, the total expense of which, including his salary, will aggregate between $15,000 and $20,000 annually.

In passing resolutions requesting the City Commission to employ a port director, the Beaumont Dock and Wharf Commission pointed out that such an official would serve the purpose not only of supervising port activity in Beaumont, but also of enlarging that activity and se-

THE LAND OF SPORT . .

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[The MALOLO will sail from New York October 27 on a gala cruise to San Francisco, calling en route at Havana, Panama, and Los Angeles. She will sail from San Francisco November 16 on her maiden voyage to the Hawaiian Islands, which she has been built to serve. The Malolo will carry 650 passengers, all first-class. You can get a room with a bed (not a berth) from San Francisco to Honolulu for as low as $125, one way only. Come with us on this joyous occasion—the maiden voyage of America's largest, fastest and finest passenger ship!]

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curing additional tonnage for the port. Thus the job cut out for the new port director is a big one and a great deal of his time and energy will be devoted to increasing tonnage that passes over Beaumont docks and in upbuilding the port.

Mr. Wiggins' experience at Portland, which is similar to Beaumont in that it is an inland port situated on a deepened channel, renders his peculiarly well qualified to understand the problems of the Port of Beaumont. The employment of a full time port director at Beaumont is the materialization of the efforts of years, throughout which time the Dock and Wharf Commissioners, the Chamber of Commerce, and other agencies interested in developing Beaumont's harbor, diagnosed the needs of the port and spent considerable time in locating a man of Mr. Wiggins' type to take over the newly created position.

Mr. Wiggins is 32 years of age, six feet in height, and 200 pounds in weight, with a splendid personality. He is a University graduate and has had extensive experience in railway transportation as well as in port and harbor work.

Port Notes

Richmond. The citizens of the city of Richmond recently approved a bond issue of $690,000 to be used in the development of port facilities. Bonds will be issued from time to time as the funds are needed.

The first step to be taken in this new expansion program will be to obtain a federal survey of this waterfront and an appropriation from the government which will match an equal share to be supplied by the city for dredging a deep channel to the harbor. The city council plans a channel 400 feet wide and 32 feet deep with adequate turning basins.

Plans are now being prepared for a new wharf and warehouse on the inner harbor, which will cost about $245,000. A contract will also be let shortly for rip-rapping the present harbor retaining walls at a cost of about $50,000.

Los Angeles Harbor. The Board of Harbor Commissioners has received bids from eight firms for the construction of a one-story transit shed at Berth 228 D and E. This work will approximate $150,000. A contract was let to R. Bergund on a bid of $33,700 for paving this wharf.

Newport Beach. The City Council of Newport Beach has under consideration the forming of a harbor district comprising the southern half of Orange County. The work of building two jetties at the entrance to the harbor is progressing favorably; but additional funds are needed to dredge the harbor and its entrance and to extend the west jetty 500 feet, thereby giving better protection to the harbor entrance. Additional bonds will have to be voted to complete this work, which is the object of forming a harbor district.

San Diego. J. C. Allison of this city has leased ten acres of city tidelands on which he plans to construct a cotton warehouse at a cost of $45,000. Mr. Allison claims that this is a part of a $600,000 cotton shipping development program.

Ventura County, California, has received the reports of two groups of consulting engineers covering their findings on a survey of Ventura County and the justification of developing a port for deepsea shipping. The reports of both groups of engineers (namely, A. L. Sondeberegger and Ben C. Williams of Los Angeles, and Leeds and Barnard, consulting engineers, also of Los Angeles) were to the effect that such a project is both feasible and justified. The point best suitable for port development in the estimation of the engineers, is Hueneme, about four miles from Oxnard. This point has the advantages of central location relative to all points in Ventura County, ready accessibility by road and rail, and an easy approach for ships, and a port there would probably in time become self-supporting. The preliminary cost estimate of initial port development is put at $2,650,000 by the engineers. A harbor board has been formed by the county, of which Richard Bard is secretary. The reports of the engineers, together with reports of prior surveys made by the United States Engineers, have been submitted to County Engineer Petit at Ventura.

Lester Jordan, popular chief engineer of the Dollar round-the-world liner President Adams.

Alaska. It is reported that Eastern interests are backing a project by Edward Wilson, a pioneer Alaskan, and associates to construct a cold storage plant at Sand Point, Western Alaska, for the storage of halibut, cod and salmon. Mangan & Timm, ship brokers of Seattle, have been appointed Seattle agents. Edward Wilson, who operates a general store at Unga, Alaska, will have charge of the work and next spring will take surveyors and equipment with him to make the necessary preparations.

Anacortes, Washington, will begin port developments, having obtained approval of the purchase of the Great Northern dock and all improvements at the foot of Commercial Avenue as unit No. 1; for the purchase of 38 acres of tidelands on the east waterfront and of 42 acres of uplands, six acres of tidelands, and 2,000 feet of waterfrontage in the west end of the city on Guemes Channel. The Great Northern dock will be improved by the addition of warehouses. Port Commissioners are W. F. McCracken, H. J. Sackett, and E. C. Howe, who will start work for government aid in dredging.

Portland. Work on the new Elrod-Trimble Terminal has progressed to the point where permits have been asked by the builders for the construction of a cold storage plant 106 by 200 feet to cost $157,000 and for the construction of a pier shed 540 by 640 feet to cost $395,000.

Seattle. The McEarchern Construction Company of Seattle received a contract from the Northern Pacific Company for extension to Pier 5 at a cost of $55,000. Work has started on the enlargement of the West Seattle grain elevator, owned by the Northern Pacific Railway Company and operated by Strauss & Co., costing $100,000.

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Freights, Charters, Sales

September 19, 1927.

THE following steamers are reported fixed with grain from the North Pacific to the U.K.-Continent: A steamer, 33/6, Sept./Oct., Dreyfus & Co.; a steamer, 33/6, Oct., Kerr, Gifford & Co.; British str. Buchanness, 33/9, Oct.; Italian str. Filippo Artelli, 33/-, Sept., Wilmer Grain Co.; British str. Alumoor, 33/9, Nov., same charterers; British str. Catherine Radcliffe, 33/9, Oct., Strauss & Co.; British str. Farnworth, 33/6, Oct., option Mediterranean 2/6 extra; Japanese str., 34/6, Nov., Balfour Guthrie & Co.; British str. King Gruffydd, 33/9, Oct./Nov., same charterers; British str. King Howell, 34/-, Oct., Balfour Guthrie & Co.; British str. Pencarrow (or substitute), 33/9, Oct., Heatley & Co.; British str. Peterston, 33/9, Sept., Wm. L. Pymm, Jr.; British str. Rio Dorado, 34/-, Oct., Wilmer Grain Co.; Norwegian m.s. Sangstad, 33/-, Sept., same charterers; British str. W. I. Radcliffe, 33/6, Sept., Wm. H. Pymm, Jr.; a steamer, 33/-, Jan., Strauss & Co.; British str. Dalworth, Oct., Continental Grain Co.; British str. Koranton, Oct., same charterers; British str. Peterton, Mediterranean, 35/6, Oct., Strauss & Co.; French str. Pisco, 33/6, November, Kerr Gifford & Co.; French str. Dunkerquois, same charterers; British str. Rio Clara, Continental Grain Co.; a steamer, 1 port Mediteranean, 36/6, Oct., Wm. L. Pymm, Jr.; (A Runciman), 35/-, Nov., Strauss & Co.; Ben, 35/-, Nov., Wilmer Grain Co.; British str. Carlton, 34/-, opt. Puget Sound, Oct./Nov., Balfour Guthrie & Co.; French str. Port de Dunkerque, 34/6, option Puget Sound or British Columbia, Oct., Wilmer Grain Co.; British str. Simonburn, Sept., Ed. L. Eyre & Co.; Norwegian m.s. Snestad, 35/-, Oct., Wilmer Grain Co.; British str. Yorkmoor, 34/3, Sept./Oct., same charterers; British str. Court, 34/9, Oct., Strauss & Co.; a steamer, 35/3, Nov., Dreyfus & Co.; Japanese str., 32/6, Oct., Canadian Cooperative Wheat Producers Asso.; Japanese str., same, Nov.; Japanese str., same, Nov.; Italian steamer Recca, 35/-, Nov., Edward L. Eyre & Co.; Italian steamer Adamello, Oct., Kerr Gifford & Co.; Swedish m.s. Pajala, Dec., Heatley & Co.; Japanese str. Brazil Maru, 33/6, Oct., Balfour, Guthrie & Co.; Japanese str., Chifuku Maru, Oct., Kerr Gifford & Co.; Japanese str., 35/-, Oct., Edward L. Eyre & Co.; British steamer Orangemoor, Balfour Guthrie & Co., unnamed steamer, 35/-, Oct., same charterers; unnamed steamer, 35/-, Dec., same charterers; British str. Westmoor, Oct., Continental Grain Co.; British str., Cornish City, (sub. for str. Buchanness), 33/9, Oct., Heatley & Co.; Italian str. Monte Santo (or sub), 33/6, Oct.; British str. Tre, 34/6, Nov., Kerr Gifford & Co.; British str. Tre, same, 35/-, Dec., same charterers; Norwegian m.s. Vestvard, 34/-, Sept., Kerr Gifford & Co.; Swedish m.s. Nuolja, 34/6, Nov., same charterers; unnamed steamer, 35/-, Jan., Edward L. Eyre & Co.; British str. Hartbridge, 35/-, Jan., Heatley & Co.; a steamer, 33/6, Nov., Continental Grain Co.; British str. Pengreep, Heatley & Co.

The following lumber fixtures to Australia are reported: British str. Hartbridge, Columbia River to Adelaide and Port Pirie, Aug./Sept., J. J. Moore & Co.; British str. Tynebridge, Columbia River to Adelaide, Sept./Oct., same charterers; Norwegian m.s. Brynje, North Pacific to Australia (option South Africa), Oct., same charterers; British str. Luceric, Humboldt Bay and Puget Sound to Australia, same charterers.

The following lumber fixtures to the Orient are reported: British str. Barrygrove, Grays Harbor to Yokohama, Sept., Canadian American Shipping Co.; American stmr. Chamblee, North Pacific to Japan, Sept., J. J. Moore & Co.; Japanese str. Yogen Maru, Columbia River to Japan, Sept., Douglas Fir Exploitation & Export Co.

The American str. San Pedro is reported fixed from the North Pacific to New York, September loading, by Hersch Lumber Co.

The Norwegian m.s. Belnor is reported fixed from Willapa Harbor and Columbia River to U. K.-Continent, lumber, Aug. / Sept., J. J. Moore & Co.

The German steamer Karpfanger is reported fixed from the North Pacific to South Africa, Oct. loading, lumber and merchandise, by J. J. Moore & Co., and the British str. Oakbank, same $22, lumber, Sept./Oct., East Asiatic Co.

The following tanker fixtures are reported: American str. Edward L. Shea, California to North of Hatteras, 65c, Sept.; American str. Pennsylvania, California to North of Hatteras, 65c, Sept., fuel oil; British m.s. El Aleto (new), 1 or 2 trips, California to U. K.-Continent, 9/-, London, prompt; Norwegian str. Lincoln Ellsworth, San Pedro to Australia, Sept./Oct.

The following miscellaneous fixtures are reported: British m.s. Silurian, Puget Sound to London, merchandise, Sept., Canadian American Shipping Co.; British str. Esther Dollar, Puget Sound and Vancouver to Rotterdam and Hamburg, wheat and lumber, Oct., same charterers; British str. Berwik Law, Puget Sound to U. K.-Continent, wheat, lumber, and general merchandise, Oct., same charterers.

The following steamers are reported taken on time charter: British str. Atlantic City, Pacific trade, 4/5 months, delivery and redelivery North of Hatteras, $1.15, Aug.; Norwegian m.s. Lionel, Pacific trade, one trip, delivery Rotterdam, redelivery Australia, $1.15, prompt, Pacific Export Lumber Co.; British str. North Pacific to Australia, same charterers; American str. West Haven, 1 year, intercoastal, Daughs Ship Crane Company; Norwegian str. Tananger, Pacific trade, delivery Newport News, prompt, Pacific Export Lumber Co.; Norwegian str. Hampholm, delivery Colon, redelivery Australia, prompt, H. R. MacMillan Export Co.; British str. King Robert, delivery and redelivery North of Hatteras via North Pacific, $1.10, Sept. loading, Canadian Transport Co.

The following sales are reported: British tank str. Acasta (flag to be changed to Norwegian), Shell Co. to Martin Mosvold, Christiansand, Norway; American sc. Glendale, Alaska Codfish Company to Halfhill Packing Co.; American stmrs. Albert Jeffress, Edgar Bowling, George Allen, James B. Duke, William Campion, and William Perkins (for intercoastal trade), Garland S. S. Co. to Calmar S. S. Co.; American str. Chamblee, $175,000 reported, Hammond Lumber Co. to Showakissan Kabushika Kaisha, Japan; U. S. lighthouse tender Madrono, U. S. Lighthouse Department to Thomas Crowley; American str. West Erral, U. S. Shipping Board to Pillsbury and Curtis.

PAGE BROTHERS, Brokers.

High Speed Diesel Engine

(Continued from page 456)

Shop Practice

The most significant points in shop practice necessary to high-speed work are the reversion to the practice of lapping and the enlargement of grinding operations. Breaking in large high-speed engines with a motor is not satisfactory. They should be so finished that little "wearing in" is required. Ground or "honed" cylinders may be run in under their own power without scoring iron pistons or damage to aluminum-alloy pistons. This is by no means uniformly possible with bored or reamed cylinders with small clearance. Both ground and honed cylinders have been used at high speeds with great satisfaction.

Lapping has also been extended to cam rollers and pins, to pump plungers, spray needles, and even to valve seats, with great satisfaction. Valve seats have been produced holding 4000 pounds fuel pressure without any hand grinding whatsoever. No great amount of training is required if the simple governing principles are followed. The scheme is to start a job with almost 100 per cent bearing surface rather than to assemble parts gauged over high spots only to find them too loose after they are run in, also to avoid much hand fitting, which causes engines to vary in service or performance with the fitter's skill.

Engine Weight

The probable weight of a design is too often underestimated. One recent engine, which according to the prospectus should have weighed 30 pounds per brake horsepower, actually weighed 60 pounds. Another engine was actually delivered at a very low weight but is now being redesigned because the aluminum heads did not stand the service.

Most of today's efforts are centered in engines of 7 to 9-inch bore. It is the author's experience based on actual estimated designs that serviceable engines will weigh about as follows:

At 600 r.p,m,, all iron and steel with bed plate	70 to 90 lb. per hp.
At 600 r.p.m., all iron and steel with hung shaft	40 to 60 lb. per hp.
At 600 r.p.m., aluminum and steel	25 to 30 lb. per hp.

At 900 r.p.m., weights should be about inversely proportional.

The great discrepancy between airplane engine and oil engine weights is caused by these factors:

600 to 1200 r.p.m. against 1200 to 2200 r.p.m.

75 to 100 lb. brake m.e.p. against 135 to 150 lb. brake m.e.p.

Detachable heads and cast-iron liners against closed heads and steel liners with valve seat in forging and passage and guides in head.

Flywheel to meet electrical guarantee against no flywheel.

Box or block engine frames for stiffness in lengths up to 12 ft. against sheet-metal jackets.

Reasonable wear and safety factors and no organized servicing against a life of 40 to 50 hr. before the top overhaul, a major overhaul after four minor overhauls, and salvage after three to four major overhauls.

Cost a major consideration against cost secondary to flight requirements.

The aviation motor deserves most serious study. It marks the ideal for which to strive if oil engines are to be used in flight. For the commercial engine it exhibits an example in rational proportions, but not in practical dimensions.

Rating

One factor of prime importance in producing lightweight engines is high brake mean effective pressure. The author has in the past six years built four high-pressure, cold-starting engines. Two of them had displacer pistons and automatic sprays. Two had diesel combustion chambers with automatic sprays centrally placed in the head. In direct comparison to these he has undertaken for his own education a series of tests on a line of diesel engines which have the diesel form of combustion chamber with cam-operated sprays. Rated at the point of best economy the brake-mean-effective-pressure capacities of the types are: Displacer-piston engine, least; diesel with automatic spray, intermediate; diesel with cam-operated spray, highest. What type of injection system is to survive the test of high speed is not yet shown, but very certainly the cam-operated spray sets the pace for high rating and freedom from detonation trouble.

Barge Erection at Balboa

An interesting piece of erecting work is in progress at the Balboa shops under the Mechanical division of the Panama Canal. Twelve scows, fabricated in the United States and assembled by bolting, were knocked down and shipped to Balboa for erection. As completed, they are towed to Buenaventura, Colombia, and delivered there to the Raymond Concrete Pile Company, who are busy on large construction work for that port.

The scows are all of similar pattern. They are rectangular, completely decked over with a steel deck, have square ends with the hull raked back in a 45-degree angle under the end, and have flat bottoms. Each scow has a transverse bulkhead a little distance from each end, so that the ends may become damaged and develop leakage without materially affecting the floating capacity of the scow. The pile drivers and derrick barge are reinforced by longitudinal bulkheads or girders to take the strain of operation. The oil barge carries a large cylindrical oil tank on deck. The pile drivers and derrick barge carry cylindrical oil and water tanks in saddles inside the hull. Except the oil barge, which is small, the scows vary in length from 75 to 90 feet and in beam from 26 to 30 feet, and are 7 feet in depth. The weights of the hulls, except the oil barge, which weighs 43 tons, vary from 54 to 84 tons.

These scows are built on the dock wall and as completed are not launched but lifted off by cranes. They are to be towed to Buenaventura in batches of three. Seven are of such weight that each can be handled by the cranes at the Balboa shops and five require the 250-ton crane Ajax or Hercules for lifting. Only the bare scows are represented in the work done at Balboa. After they reach Colombia the equipment above the deck line will be supplied and built by the Raymond Concrete Pile Company.

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Pacific Marine Review

The National Magazine of Shipping

November, 1927

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Pacific Marine Review

CONTENTS

November, 1927

Frontispiece ... 11
Editorials ... 493
Let's Worry About Our Merchant Marine, by Myles B. Lambert ... 494
The Maritime Safety Movement and Its Relation to America's Merchant Marine Problem, by Norman F. Titus ... 495
The American Marine Situation, by T. V. O'Connor ... 497
Building Safety Into Ships, by H. E. Parker ... 498
Home Port Welcomes Malolo ... 501
Malolo's Most Modern Galley, by P. H. Vivian ... 506
Twelve hundred persons served daily using electric cooking and baking equipment.
History of the Once Famous Clipper Ship Golden State, by F. C. Matthews ... 508
Sic Transit Gloria Mundi ... 509
Purchasing a Diesel Engine, by C. G. A. Rosen ... 510
Modern Cargo Cranes, by Bernard Dunell ... 512
Types available, factors governing selection, and latest developments.

In the Engine Room:

At the Chief's Desk, by C. E. Milbury ... 514
Lubricating Power Cylinders of Diesel Engines ... 515
Insulation Measurements by Voltmeter, by J. M. Dodds ... 516
Dope on Scotch Boilers ... 516
Ever in a Tight Corner? ... 517
A Boiler Room Fire ... 517
A Fouled Wheel ... 517

Pacific Workboats and Their Power Plants:

Puget Sound Workboats ... 518
Tacoma Boatyards ... 522
Union Diesel Sales for Yachts and Fish Boats ... 522

Converting Steam Engineers, by Robert H. Stone ... 523

Auxiliaries, Ship Supplies, Marine Equipment:

Modern Sounding Methods ... 524
Artistic Deck Coverings ... 525
A Folding Berth de Luxe ... 525
Lipman Refrigeration, by C. Sowers ... 526
Yale Electric Tractors ... 526
A Simple and Inexpensive Valve Tester ... 526
A Turbine Stethoscope ... 27 Adv. Section
Allan Cunningham Busy ... 27 Adv. Section

Marine Insurance ... 527
American Shipbuilding ... 533
The Yachts of St. Francis ... 540
Steel Carfloat for Santa Fe ... 25 Advertising Section

Of a General Nature:

For Better Navigation ... 500
Trade Literature ... 531
New Marine Equipment and Constructive Service (Sutor) ... 532
Worthington Announcement ... 532
Fred Moon Joins C. E. Rhodes Co. ... 532
L. O. Kuhn Impressed by West Coast Shipping ... 532
Who's Who Afloat and Ashore ... 15 Adv. Section
Freights, Charters, Sales ... 29 Adv. Section

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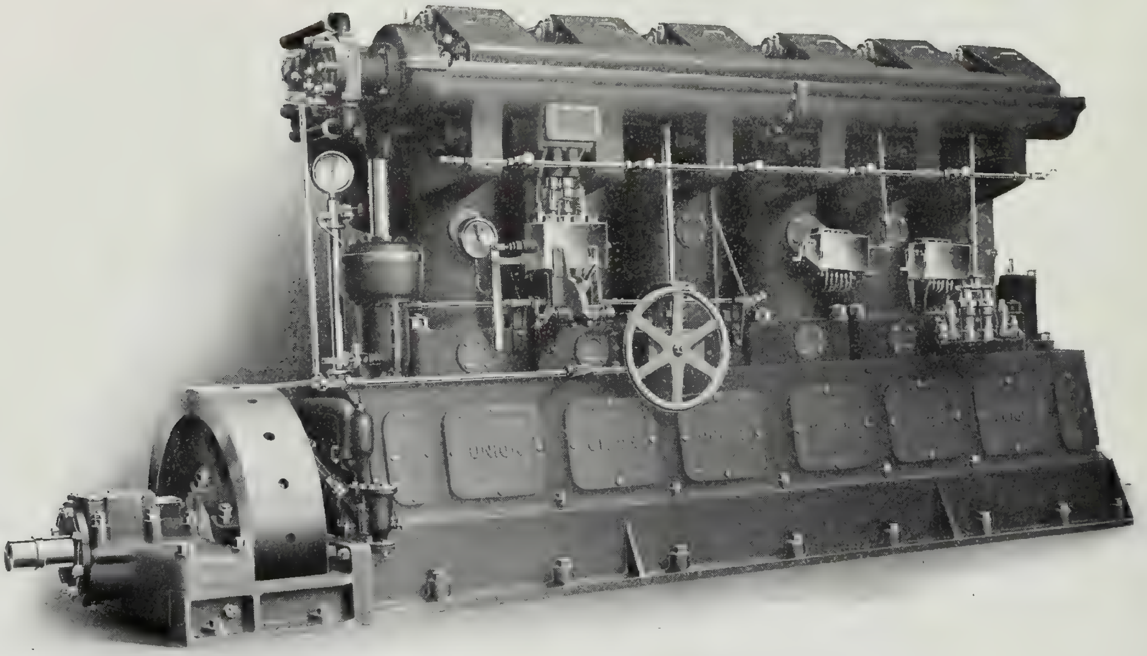

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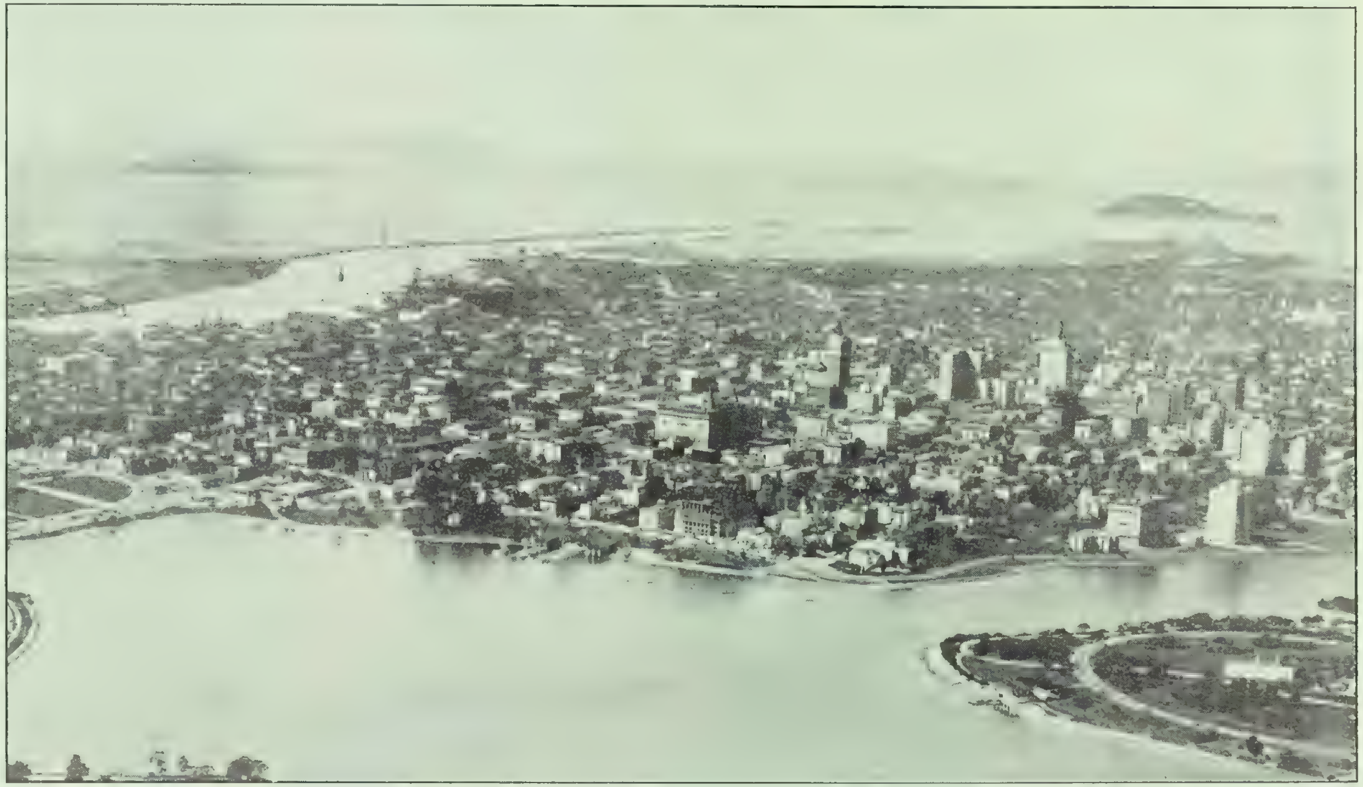

Aeroplane View Looking Across Oakland's Business District and Harbor to San Francisco and the Golden Gate

(Copyright by Aerograph Company, Oakland, California)

WASHINGTON IRON WORKS

Government Chooses Washington-Estep Diesels for "*Teal*" and "*Crane*"

Two new boats of the U.S. Fish Patrol Service will cruise Pacific waters under the power of Washington-Estep Diesel Engines. The "Teal" particularly, was designed for carrying U. S. fisheries officials on inspection cruises, and more than the usual amount of care was exercised to obtain comfort and dependable power. Washington-Estep Diesels in both cases were chosen because of their sturdiness, economy of operation, and easy accessibility.

The "Teal" is 78′ long x 18′ x 6′6″ draft, using a 6 cyl. 150 b.h.p. Direct Reversing Washington-Estep. The "Crane" is 90′ longx20′x9′6″—to be powered with a 6 cyl. 200 b.h.p. Direct Reversing Washington Estep.

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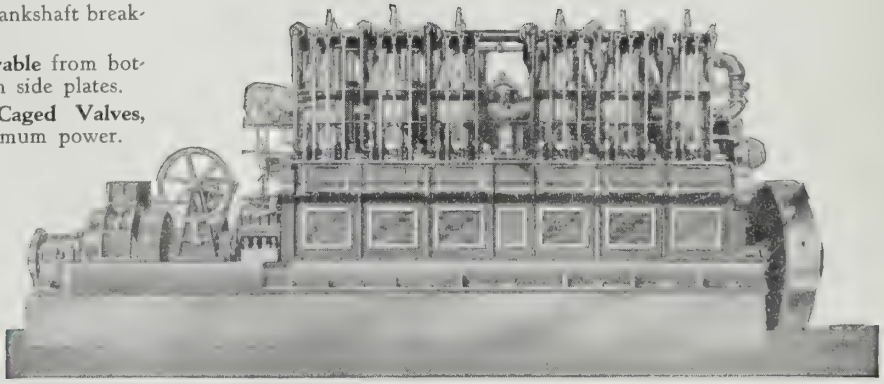

"WASHINGTON-ESTEP" DIESEL ENGINES

November 1927 VOL. XXIV., No. 11

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The National Magazine of Shipping

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Official Organ Shipowners' Association of the Pacific

James S. Hines, President and Publisher.

Bernard N. De Rochie, Vice-Pres. and Manager.

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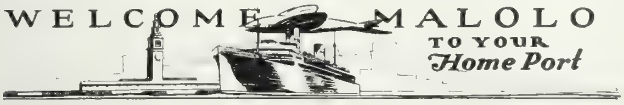


ON Armistice Day, November 11, 1927, the Malolo, palatial new passenger liner for the San Francisco-Hawaiian service of the Matson Navigation Company will be welcomed at her home port of San Francisco.

The arrival of this vessel, undoubtedly the most elaborately equipped steamship ever turned out by an American shipyard, is of especial significance because she typifies merchant marine progress on the Pacific Coast.

In her conception, financing, operating management, and service, the Malolo is 100 per cent Pacific Coast.

She is among the three fastest (if not the fastest) of all commercial vessels in the American merchant marine.

Her safety equipment and construction are more than 100 A-1 rating with the United States Steamboat Inspection Service, the American Bureau of Shipping, and Lloyds.

Her passenger accommodations reflect the demand for good taste combined with luxurious comfort that is characteristic of the Pacific traveling public.

In short, the Malolo is a superlative ship, instituting a super-service, and the Pacific Coast, together with San Francisco and Honolulu, extends to her a Royal welcome.

Aloha Malolo!

Forward Step by Shipowners

AT the annual meeting of the Shipowners' Association of the Pacific Coast, held September 28, Frank J. O'Connor was reelected president to serve for the fifth term; R. W. Myers was reelected vice-president, and James H. MacLafferty, excongressman from Oakland and, until the first of the month, first assistant secretary of commerce, was also elected vice-president. Nat Levin was reelected secretary-treasurer.

The feature of this meeting was the innovation of electing James H. MacLafferty a vice-president of the association. Mr. MacLafferty is to be established permanently in Washington as the representative of the Shipowners' Association of the Pacific Coast, and the Pacific American Steamship Association.

This is a very forward-looking move on the part of the shipowners of the Pacific Coast, who have been during their history uniformly the leaders in the initiation of movements for the betterment of the American merchant marine. Mr. MacLafferty having had training and business experience from the Pacific Coast angle and having had legislative experience and contact and entre into official circles at Washington will be able to cooperate to the fullest advantage with the representative of the American Steamship Owners' Association and to obtain full recognition of the special problems confronting Pacific Coast shipowners in the initial stages of any reforms or legislation that may be proposed.

Annual Steamship Dinner Hotel St. Francis, San Francisco, October 22nd, 1927.

Trade Exposition

ON November 11 to 20, the Foreign Trade Club of California will hold its Pacific Foreign Trade and Travel Exposition. Practically all of the large steamship companies are to have exhibits of pictures, models of their vessels, and movies.

The Shipping Board will exhibit its famous talking movies, featuring "world travel, world ports, great cities, scenic wonders, and the construction and operation of a huge ocean liner. The tentative program calls for an address by T. V. O'Connor, chairman of the Shipping Board, on the subject, "American Merchant Marine."

Let's Worry About Our Merchant Marine

By Myles B. Lambert, Transportation Sales Manager, Westinghouse Electric and Manufacturing Company*

Myles B. Lambert

"DON'T Worry," is a fine old, weather-beaten phrase, As advice, it is handed out daily far more often than any other variety, and as an ideal of life, it has no competitor.

Some people actually do attain to this ideal and in consequence live long and happy lives. But a point that those who never worry usually overlook is that they live long and happily because they manage to pass the buck and let some one else do their worrying for them.

In spite of all authorities to the contrary, worry, in moderate and not paralyzing amounts, is a good thing. It is the great stimulus to action. When you are not worried about a situation, you do nothing about it; but when you begin to worry, you begin to get busy.

The American people did not worry about their merchant marine from 1850 to 1914, and as a result they had no merchant marine. In the year 1914, 8 per cent of United States goods in foreign trade was carried in vessels under the United States flag, and 92 per cent in foreign vessels. That's what the "Don't Worry" policy did.

During the World War we got violently worried about ships, and in 1920, 42 per cent of United States goods in foreign trade was carried in vessels under the United States flag. That's what worry accomplished.

But since the war we, as a nation, have once more ceased to worry about this particular matter, and the consequences are that the amount of United States goods in foreign trade carried by vessels under the United States flag has fallen to 32 per cent; that the United States is the only commercial nation of the world reporting a net decrease in its ocean-borne shipping for the past 7 years; that Great Britain, Japan, France, Italy, Germany, and "all other nations," except the United States, have increased their merchant tonnage; and that the tendency in our case is unmistakably back to the pre-war situation.

Now this, I aver, is something worth worrying over —moderately and with due restraint.

An adequate supply of suitable United States merchant vessels is essential to the continued welfare of the United States. Due to the greatly enhanced productiveness of our industries in recent years and to our policy of restricting immigration, we are facing the necessity of finding larger and larger foreign markets for our surplus products—both industrial and agricultural. If we must depend upon foreign ships to carry this surplus, we must pay the penalty of dependents and not only pass out good money to those who are doing our work for us, but we must be prepared to be hampered in our foreign commercial relationships at all times and even be left without means of transport when we most need it.

During the coal strike in England last year, the carrying of coal was so profitable that ships could not be found to move much of our cotton and perishable foodstuffs, which resulted in heavy losses to our agricultural producers. Should a war break out, even if the United States were not a belligerent, we would inevitably suffer enormous commercial losses if our shipping were not sufficient for our needs.

In a word, we are rapidly heading into a situation, due to the decay of our merchant marine, that at any moment may become intolerable to us as a nation and ruinous to millions of us as individuals.

But what are we going to do about it?

That's where the worriment comes in. The truth of the matter is that our merchant marine situation is so complex and is affected by so many diverse factors that there is no one and simple remedy. If proof thereof be needed, I can offer in evidence a collection of remedies proposed during the past year by some of us who are worried about our shipping, among which will be found the following:

> Get the government out of the shipping business.
>
> Let the government spend a hundred million dollars or so to get deeper into the shipping business.
>
> Let the government subsidize United States shippers.
>
> Persuade United States shippers to ship their goods in United States vessels.
>
> Repeal the La Follette laws, which compel ships under the American flag to carry certain financial burdens from which foreigners are free.
>
> Make the United States citizen, and especially the United States farmer, ship-minded.
>
> Design ships that can be operated at a profit by modern American methods.
>
> Repeal the protective tariff.
>
> Increase the size of our cruiser fleet, thereby increasing the confidence of our ship operators.

This list could be extended considerably if necessary, but it is long enough to show that there is quite a variety of opinions on the subject.

In justice to my fellow-worriers, however, it must be said that while one special remedy is usually emphasized almost exclusively in any given article, all thoughtful writers on marine subjects agree that many different reforms are needed, and that the rehabilitation of our merchant marine is a great national problem which can be solved only by a comprehensive program in which all must cooperate whole-heartedly—government officials, ship owners and operators, shippers, shipbuilders, engineers in the marine, steam, oil engine, and electric fields, business men in general, farmers, and every other class of persons who have an interest in the welfare of the United States—in a word, the nation itself must worry about our shipping.

---

*Extracts from an article published in Forbes Magazine.

My own personal contribution to the symposium by those-who-are-worried-about-our shipping is briefly this:

In my professional career, which has brought me into close contact with the railroads, the street railways, the electric power companies, and other industries touched with the public interest, I have more than once seen order brought out of chaos and threatened ruin transformed into prosperity by the following operation:

All the facts in the situation are first collected, carefully studied, and presented to those directly interested. This process immediately invokes discussion, some claiming the facts mean this and others that they mean exactly the opposite; but out of the flurry come an increasingly clearer view of the situation and a better understanding of the causes and effects involved. Then there are evolved constructive plans to eliminate, one by one, the obstacles that lie in the road running in the desired direction.

The next step is to educate the public as to the facts, the plans and the reasons therefor, and the results that are expected. Again there is a flurry of discussion, charge and counter-charge, endorsement and opposition, but if the situation is accurately outlined and if the results to be secured are seen to be beneficial to the public as a whole, the problem is finally solved to the satisfaction of all concerned.

Such an operation often takes years, and it cannot be carried through without much effort on the part of highly trained men; but in commercial matters of national importance it seems to be the only way that is effective and that insures protection to the public.

It seems to me that the time is ripe to apply a procedure of this kind to our merchant marine problem, and I believe that the way to get started is for our leading national and professional organizations, who think they have no interest in our merchant marine, but really have a vital one, to get worried about the subject and start discussing it. (The very small number of national organizations who **know** they have an interest in our merchant marine are already busy).

After a year or two of such discussion and the compilation of all the pertinent facts by such organizations as the Department of Commerce and the National Industrial Conference Board, the way to proceed will become clear. And if the proposed procedure is understood by the people of the United States and if they will benefit by adopting it, all existing obstacles—political, commercial, and technical—to the upbuilding of our merchant marine will be swept away.

The Maritime Safety Movement and Its Relation to America's Merchant Marine Problem

By Norman F. Titus,

Chief, Transportation Division, Bureau of Foreign and Domestic Commerce

AMERICANS, generally, are beginning to realize quite definitely that their country can no longer pursue a policy of isolation and self-sufficiency. Irresistible economic forces, largely due to the World War, have brought about new conditions which are presenting problems demanding early recognition and settlement.

As a result of its economic evolution, the United States is now a creditor nation; this is a new role, for hitherto it has been a debtor nation. This new development inevitably will produce profound changes in our economic status and force upon us new lines of action and new responsibilities. It is possible that, very shortly, we shall be importing more than we export and thus shall have an unfavorable trade balance. Such a change, however, will be accompanied by a great development of other functions of service, the payments for which are classified as invisible items on the international balance sheet. In other words America may buy more than she sells, but she will equalize matters by acting as banker, ship-owner, insurance underwriter and investor for other nations. In this way other nations will pay invisible tribute to her. The study of economic history reveals the operation of these principles with great clearness.

However, it does not take a student of economics to recognize the growing importance of the necessity for an American merchant marine; the mere fact that the United States has a foreign trade of ten billion dollars a year, and that the freight bill for transporting this great quantity of goods is six hundred million dollars a year, is proof enough that our merchant marine is an imperative necessity. Obviously as good merchants, Americans should do as much of their own delivering as possible.

Nevertheless, it does not require any evangelist to expound the doctrine of an American merchant marine, the American public is already strongly on record concerning this matter. Ever since the World War taught us the supreme importance of shipping, we have been clamorous for a merchant marine. Only last year this fact was evidenced in a most emphatic manner. The Shipping Board had been called upon by the United States Senate to prepare and submit to it comprehensive and concrete plans for building up and maintaining an adequate merchant marine, either publicly or privately owned and operated, for commerce and national security. The Board supplemented its own study and investigation by conducting public hearings in thirty-three cities and also by addressing nine thousand questionnaires to representative organizations and individuals throughout the country.

The result of these inquires was summarized in three statements:

No. 1 It was unanimously held that the United States should have an adequate merchant marine for national defense and commerce.

No. 2 With almost equal unanimity, it was held that the merchant marine should be privately owned.

No. 3 With equal unanimity, it was held that until it is made possible for private interests to successfully own and operate the American merchant marine, the Federal Government must continue to do so.

Thus, we have a clear and definite public affirmation of our merchant marine policy in favor of private ownership and operation as enunciated in the Merchant Marine Act of 1920. This is as it should be, for one of the fundamental principles of our democracy is the preservation of the vital initiative and enterprise of our people. This statement of principle may be clear but the actual putting it into practice constitutes our American merchant marine problem.

It has been pointed out repeatedly that the prerequisite of any successful operation of American merchant vessels in the foreign trade, by private initiative, is equality of opportunity with our principal foreign competitors. All that American shipowners have ever asked is an even start with their competitors; with this even start they guarantee profits. If they cannot guarantee profits, the investor will turn elsewhere, and without a supply of funds an American merchant marine would be an impossibility.

Ship Operating Equality?

At the present time, there are three issues that have to be met in order to achieve the necessary equality of opportunity for American shipowners. They are:

(1) The capital charges of our shipping must equalize those of our foreign competitors.

(2) Operating costs must approximate those of our competitors.

(3) Investors must be definitely assured of freedom of private owners from government competition; in fact, the menace of the great government fleet must be removed, once and for all.

These various factors are too well known to require elucidation for they have been debated in and out of Congress for years and there is a very extensive literature on the subject. Suffice it to say, however, that these disadvantages arise both from legislative requirements and restrictions and also industrial charges, all of which, in the main, have their genesis in commendable causes—better wages and better conditions for American labor.

Trade Route Contract System

Many solutions have been offered for these difficulties; but, while it is obvious that some form of governmental aid must be extended to maintain a merchant marine adequate for commerce and national security, nevertheless, the public and shipowners, generally, have looked with disfavor on any subsidy based on the tonnage or speed of the ship or upon the size or organization of the crew. Out of the continuous discussion, however, has been evolved a plan which is now meeting with much favor. It calls for a vigorous adherance to the spirit and letter of the Merchant Marine Act of 1920, quickly reducing government operations and placing ships in private hands under what is known as the trade route contract system.

This plan first calls for a committee of inquiry composed of representatives of shippers, shipowners, and government departments to determine exactly which trade routes are vitally necessary. The next step is a study of each individual route and an evaluation of its physical operation. In this study the committee will consider all factors of physical operation such as cargo offering and competitions, and will determine what it should cost to maintain a service of a certain definite number of sailings per year. If the route can, in the judgment of the committee, be operated under normal conditions at a profit, then no governmental aid would be recomended. If, however, aid is necessary, the committee will determine the amount. After all this investigation has been completed, the plan proposed is that the government shall contract with private owners to render service in each route, the government paying a bonus of such a sum as the committee determines.

There are many details connected with this scheme. For instance, the Chamber of Commerce of the United States holds that the routes should be put up for competitive bidding. Others hold the view that the government shipping organization should be revamped. At any rate, this trade route contract plan seems to offer a feasible solution of this merchant marine problem that has vexed us so sorely. Such a solution would guarantee equality of opportunity and enable our shipowners to get an even start.

Management Methods

However, this theory of trade route contracts is only half the story; for once we place our shipowners on even basis with foreign shipowners, American genius will be called upon to produce and maintain that refinement of operation that will give the same supremacy in maritime affairs that America possesses in industry. If this supremacy is to be attained it must be acquired by the same methods; the shipping executive must display the same capacity for efficiency, economy, and scientific management that his brother industrial executive displays. For over a generation, American industry has been battling with the question of higher costs and has been conspicuously successful in its efforts. So striking have been the results that, during the last two or three years, delegations and commissions from Europe have arrived in this country to study our industrial methods.

The shelves of every library are weighted with books dealing with the subject of American industrial methods. In these volumes we find our educational and social systems analysed as to their effects upon our industrial progress; there are books without number upon mass production, refinements of methods and machinery, discussions of the human element in business, elimination of waste, scientific management, employee representation, safety engineering, cost accounting and many allied subjects.

Although industry has made such a remarkable record in the solving of its problems, apparently it has never occurred to shipping executives to profit by this experience. Railroad executives have been more alert, however, for during the last five years they have adopted many of the principles found in industry with the result that a veritable revolution has been wrought in railroading.

Opportunity for Shipping

Herein lies a tremendous opportunity for shipping. By concerted and militant effort on the part of shipowners, the government aid program based upon trade route contracts can be consummated. With this achieved, shipping would have the equality of opportunity that has long been its dream. With this dream realized, adoption of the same intelligent and scientific methods as prevail in industry would make our merchant marine an outstanding success.

In launching such a new program the maritime safety movement is, undoubtedly, one of the most obvious and promising methods of attack. For several years, especially the last two, shipping has been laboring under excessive costs for personal injury insurance; this has been due to the increasing severity and number of accidents. As the increase in rate has been caused by excessive accidents, the remedy is to reduce the number of accidents. Industry has faced this same issue for twenty-five years and has successfully met it with safety engineering.

The American Marine Situation

By T. V. O'Connor, Chairman, United States Shipping Board.

CHAIRMAN T. V. O'Connor of the United States Shipping Board has recently sent to many senators a statement which, in a few, plain words, adequately summarizes the present situation facing the American merchant marine. This statement and its letter of transmittal are, we think, calculated to clear the merchant marine thought of the country and we reproduce them here in full:

Letter of Transmittal

"Dear Senator:

"Much is being said in the press and elsewhere about the American merchant marine, and a great many things have been injected which tend to confuse the national purpose and needs in this regard. I have endeavored in the enclosed statement to focus into a few words what the real situation is, and I should feel it an honor if you could find time to read it.

"Whether we should continue to carry out the Merchant Marine Act as we are now doing, whether there should be drastic legislation which would bring about an abrupt transfer to private capital, or whether we should abandon any attempt to have a merchant marine at all are questions which will no doubt loom up for more definite discussion and conclusion in the near future.

"With best wishes, I am very truly yours,

"T. V. O'CONNOR, Chairman."

We have an act of Congress passed in 1920 known as the Merchant Marine Act, clearly defining our purpose at all events to have a merchant marine adequate for commerce and as a naval auxiliary. I think the realization of the need of and the sentiment of the people for a merchant marine is many times stronger today than when this act was passed, so that there is no question as regards a national policy.

As amended by the said act of Congress,the Shipping Board took a lot of ships built primarily for a purpose and which had answered that purpose and started on the development and maintenance of American-flag steamship lines where no such lines had existed for 75 years. But for this there would today be practically no American-flag ships in the foreign competitive trade.

Lines Are for Sale

At present the Board maintains a minimum number of overseas steamship services and these services are not in competition with privately owned American-flag vessels. It holds these lines and individual ships out to American capital for purchase under the most favorable terms and continues to operate upon strategic trade groups only until such time as private capital can and will take them over. Private capital has already taken over some of our lines but just when it will take over any considerable number of the balance for operation on a permanent basis nobody can tell under present conditions.

Ship Operation. There has been much progress made in our ship operation. Efficiency and entrenchment in the business are steadily improving. Congressional appropriations for ship operations have been reduced from $75,000,000 for 1921 to $17,000,000 in 1927.

Ship Sales. The Merchant Marine Act, although looking to ultimate private ownership, does not direct the Board to sell ships at all hazards. It seems certain that the spirit of the act is that we should sell ships and ship lines whenever that can be done consistent with the development and permanence of an American merchant marine. Accordingly the Board has never sold an established ship line except when predicated upon the belief that such sale with a guarantee period would result in permanence to a moral certainty. Therefore, it is felt warranted in selling on liberal terms in order to enable the purchaser to meet competition during the development period, believing that from the purchase would result a privately owned ship line in foreign competitive trade firmly established. Without this feeling of permanence the Board should not, of course, sell the line but should continue its operation by the Government until a healthier condition existed when it could be expected to be maintained by private capital.

The Shipping Board since 1921 has sold to American citizens 1,134 ships, representing 4,993,346 tons, for $84,411,023.39. This includes nine established ship-line services sold upon the basis of guaranteed operation for a fixed number of years.

The future. If Congress and the people want the permanent operation of shipping lines turned over to private capital immediately, it will require substantial Government aid flowing to the private owner to accomplish that end. If, however, they are willing for the Government to operate the ships during the development period and to turn them over to private capital gradually, that will be done in the manner provided for in the Merchant Marine Act and the ultimate transfer for continued operations accomplished.

Conditions Not Improving

We are carrying out the Merchant Marine Act as best we can, transferring ships to private capital for guaranteed operation wherever possible and meanwhile operating as efficiently as can be done with ships which were built for war purposes and not suited for formidable competition with foreign-owned modern vessels. The situation is not improving because since 1921 for every single ship of 2,000 gross tons and over, that has been built in the United States, Great Britain has built 42, Germany 12, France 5, Italy 4 and Japan 4. Of the total volume of American foreign commerce export and import American vessels today carry less than 30 per cent; the balance is carried in foreign flag ships.

We would rather see private capital own and operate as soon as possible but that is a matter which should not be permitted to retard progress or to defeat the paramount thing we have set out to do.

We must either go forward or backward.

Building Safety Into Ships

**By H. E. Parker, General Manager, Fore River Plant,
Bethlehem Shipbuilding Corporation, Ltd.**

AT the last meeting of the National Safety Council an excellent paper on the subject of "Building Safety into Ships" was read by H. E. Parker, general manager of the Fore River Plant of the Betheleham Shipbuilding Corporation. From that paper the following is extracted:

The main factor in the development of hull construction, tending toward the greater safety and strength of ships, is the watertight subdivision of hulls. It is obvious that the equipment of a ship with life-saving apparatus and appliances is secondary to the construction of internal bulkheads, dividing the ship into watertight compartments which will secure such a reserve of buoyancy as will enable the ship to remain afloat for a reasonable period of time after a serious accident, and thereby insure, with the aid of proper and efficient arrangements, that all the units of the life-saving apparatus can be safely launched into the water with their quota of passengers.

In Great Britain's Merchant Shipping Act of 1854, it was enacted that "every steamship built of iron, of 100 tons and upwards, shall be subdivided by substantial, transverse, watertight partitions, so that the fore part of the ship shall be separated from the engine room by one of such partitions, and so that the after part of such ship shall be separated from the engine room by another of such partitions; also, that every screw ship built of iron shall, in addition to the aforesaid partitions, be fitted with a small, watertight compartment enclosing the after extremity of the shaft."

These partitions, or bulkheads, were to be provided in addition to the collision bulkheads which were required to be fitted forward on all vessels of that period.

This law was repealed in July, 1862, and the reason given for the repeal was: "not because of any doubts as to the necessity for proper and sufficient watertight partitions, but because these enactments, which required only two of such partitions for all sizes and classes of ships, had become practically useless or mischievous."

It was found that in large vessels more partitions were necessary to insure the safety of the ship, than the number required by the law in question; and it was thought better to leave builders and designers unrestricted in providing, extra strength and security for the various types and sizes of ships, rather than to pin them down by statutory regulations, which could not be drawn up in such form as to cover the constantly changing needs and circumstances of the shipbuilding trade.

The London Disaster

The loss of 233 persons in the passenger ship London in 1866, together with the foundering of the Amalia, led to a meeting of the Council of the Institution of Naval Architects to consider the general question of safety of life at sea. It was considered that one of the things far from satisfactory at that time was the number, position, and construction of bulkheads in passenger and other ocean steamers. Recommendations were formulated by the Council in 1867, the fifth of the list reading as follows:

"It would add much to the strength and security of steamships if transverse and langitudinal bulkheads, coal bunkers, iron lower decks, and screw alleys were all so connected with the hull of the ship and each other, as to form independent cellular compartments, watertight and having all their communications with the decks and each other by watertight doors, worked from the deck. In proportioning the compartments (especially in ships devoted to passengers), it is desirable to so arrange them, that if any two adjacent compartments be filled with water, or placed in free communication with sea, the remaining compartments will float the ship. It is considered that no iron passenger ship is well constructed unless her compartments be so proportioned that she would float safely were any one of them to be filled with water, or placed in free communication with the sea. Double bottoms are to be regarded as a great element both of safety and strength in the structure of a large iron ship."

The matter of double bottoms will be considered later on in this paper, but now it is desired to call attention to the fact that the foregoing recommendations to shipowners and shipbuilders had but little effect, as was shown by the results of an investigation made by the British Admiralty in 1875, for the purpose of determining the suitability of mercantile vessels for certain government purposes. It was found that only about thirty vessels complied with the minimum requirements deemed necessary by the Council in 1867, while over 4000 vessels failed to meet the minimum requirements.

Following this investigation there was a decided improvement in ship construction, conforming to the requirements mentioned, for in 1883 some 400 vessels were found that compiled with the minimum requirements as formulated by the Council.

Many of the vessels of that period had bulkheads fitted that ended at the height of the load waterline and were therefore useless insofar as the safety of the ship after damage was concerned; as a matter of fact such bulkheads were primarily fitted for the purpose of adding strength.

In reference to the matter of double bottoms, it was about 1860 that water ballast tanks began to form a part of the bottom structure of steam colliers. The cellular double bottom is to a large extent an evolutionary development of the McIntyre tank, so the early steam colliers were to that extent the progenitors of the typical mercantile steamer of today.

In 1876 a system of double bottom, bracket framing was introduced; but it was not until about 1880 that the cellular double bottom appeared in mercantile ships in a form at all resembling the present form; although an arrangement somewhat like it had been adopted some years previous in armoured warships, but without the characteristic feature of the margin plates at each bilge, with its frame attachments, which up to the present time, with some modification, is peculiar to the mercantile steamer.

In 1887 cellular double bottoms had become quite general in both cargo and passenger ships, but up to a couple of years later some of the largest and fastest ships were constructed without double bottoms, and with ordinary floors and shaped keelsons standing upon them. A few years later only vessels built for carrying petroleum in bulk, and some of the smallest cargo steamers in the coasting trade, were being built in that way.

Results shown in the cases of collision of large steel ships fitted with double bottoms have demonstrated quite conclusively the great protective value of the double bottom.

The shipping classification organizations have played an important part in obtaining increased subdivision construction in ships, particularly since 1882. Their requirements insisted upon more bulkheads for the larger vessels than were demanded by the repeal law of 1854, the increased number of the bulkheads being determined by the length of the ship, and the requirements specified the approximate positions of the bulkheads.

In 1887 a committee of the House of Commons of England, appointed to consider the laws relating to boats and other life-saving apparatus, stated in their report: "The proper placing of bulkheads so as to enable a ship to keep afloat for some length of time after an accident has occurred is most important for saving life at sea, and a thing upon which the full efficiency of life-saving apparatus largely depends."

Board of Trade Committee

An advisory committee appointed shortly afterwards by the British Board of Trade expressed the same opinion; and in March, 1890, a special committee was appointed by that body to consider and report upon "the manner in which ships shall be sub-divided so that they may float in moderate weather with any two compartments in free communication with the sea," and further "what precautions are necessary as to openings in longitudinal bulkheads to enable the water to pass freely, or under control, from one side to the other in case of the ship showing signs of instability, as might readily be the case should she be struck on a transverse bulkhead and two compartments, both on one side, be in free communication with the sea."

The committee recommended that the suggested standard should apply to all seagoing steam vessels, not less than 425 feet in length, which held passenger certificates under the Merchant Shipping Act and, also, to cross-channel steamers, irrespective of their length, whose principal employment was the carriage of passengers and mails.

Somewhat less rigid requirements were proposed for smaller types of sea-going vessels. The committee further recommended: "that a compartment subdivided by one or more longitudinal bulkheads should be treated as one compartment only, unless the owners satisfy the Board of Trade that the vessel will not have her stability seriously reduced, or list, so that any part of the bulkhead deck at the side is under water, in the event of a space between a longitudinal bulkhead and the vessel's side, or of two such adjoining spaces on the same side of the vessel being open to the sea. If the Board of Trade is not satisfied in this respect, trimming valves should be fitted at such longitudinal bulkheads."

The report of this special committee exerted a beneficial influence tending toward a further improvement of watertight subdivision of ships and a consequent increase of safety.

Titanic Disaster

The Titanic, which sank with a loss of 1498 lives, following her collision with an iceberg in 1912, and whose loss shocked the civilized world, had only a single skin on her sides above the double bottom. It was the general opinion that if the ship had been fitted with an inner skin carried up the sides of the ship from the inner bottom skin she would not have been lost.

After the loss of the Titanic, her sister ship, the Olympic, was withdrawn from service for a number of months while having an inner skin fitted.

Longitudinal bulkheads are fitted in the best and fastest ships crossing the ocean today. The additional protection afforded in the case of a collision where the outer skin of a ship is penetrated is quite obvious.

The stiffening of watertight bulkheads has been greatly improved upon. In 1860 the only stiffening provided, beyond what was afforded by the several decks, consisted of angle bars of reverse frame size spaced about 30 inches apart. The steamer of small tonnage built at that time usually had more decks than would be the case today, but the bulkhead stiffenings were, as a rule, inadequate to the task of resisting the pressure of a hold being filled with water. Lloyd's Register increased the stiffening requirements by insisting upon vertical stiffeners, of frame angle size, and the addition of horizontal stiffeners spaced four feet apart. Later on deep vertical webs at the middle line and on each side were added, their number being determined by the breadth of the vessel, and these were supplemented by semi-box stiffeners in cases where decks were not laid on the beams and by fitting brackets to the heels of the vertical stiffeners and to the extremities of the horizontal stiffeners. Subsequent developments resulted in the general practice of using vertical stiffeners only, frequently formed by flanging the edges of the bulkhead plates, which for this purpose are arranged vertically. The stiffening of the bulkheads in the way of each 'tween deck and in the holds, being governed by both the depth from the top of the bulkheads and by the height of 'tween decks or depth of holds, as the case may be. The stiffening of transverse watertight bulkheads of today is a decided contrast to that of the past.

International Conference

The loss of the Titanic already mentioned, brought about the great International Conference on Safety of Life at Sea, held at London, England, from November 12, 1913, until January 30, 1914, with official commissioners representing the governments of the United States (eleven commissioners were sent to represent the President of the United States) Great Britain and Possessions, France, Italy, Russia, Germany, Spain, Austria, Belgium, Netherlands, Norway, Sweden, and Denmark, having at their service the knowledge, skill, and experience of the world's foremost naval architects, marine engineers, shipbuilders, shipowners, and navigators, united for the purpose of making a worldwide effort to minimize, so far as human skill and effort could compass, the hazards confronting the lives and ships at sea. The conference resulted in the formulation of Articles and Regulations prescribing the methods and practices to be used for minimizing every known form of hazard to life at sea. The Articles and Regulations cover the greatest range, providing for ice patrol and destruction of derelicts, navigation safety laws, construction of ships, signal codes, provisions of life saving apparatus and appliances, fire-fighting equipment, training of ships' crews in boat and fire drills, etc.

Senate Document No. 463, Sixty-Third Congress, Second Session, published by the Government Printing Office in April, 1914, defines the types of vessels in the United States to which the Convention Articles and Regulations apply.

Malolo

That the modern ship, constructed in accordance with the requirements demanded by rules and regulations adopted by the International Conference on Safety of Life at Sea, is a safer ship than any constructed in the past was convincingly demonstrated on May 25, 1927, when the steamship Malolo, while on her trial trip, was rammed by the freighter Jacob Christensen while proceeding through a fog about 15 miles southwest of Nantucket Shoal lightship. Distress calls radioed by the Malolo after the crash brought ships to her side from every point of the compass, but they resumed their voyages later when told that the injured ship was not in need of assistance. The Malolo was towed to New York for repairs. A few brief extracts from an account of the accident, which appeared in the May 29 issue of the New York Times gives us the following information: "Her two fire-room compartments were flooded with more than 6000 tons of water, which had poured through a great gash below the waterline, yet the ship floated on a comparatively even keel, although drawing more than her normal draught." "An enemy ship seeking to disable her could not have selected a more vital spit," is the opinion of Rear Admiral David W. Taylor, U.S.N., retired (who was on board as an observer), "yet she remained afloat. It is unprecedented," he said, "to see a ship rammed square amidships and still float. The Empress of Ireland went down in a few minutes in the St. Lawrence River from a similar injury.

The Malolo carries 20 non-sinkable lifeboats, with a carrying capacity of 1016 people; 54 more than her total list of passengers and crew. Two of these lifeboats are heavy duty motor boats, each equipped with wireless sending and receiving apparatus and capable of towing all the other lifeboats.

Safety Afloat

The circumstances attendant upon the accident and the nature of the injury received by the Malolo furnish a complete illustration, requiring no elaboration, of the value of the subdivision of the hulls of ships into water-tight compartments. It is well worth the expenditure of considerable thought and money, and the effecting of compromises where necessary, if it leads to the designing and building of hulls which will not lose their buoyancy and stability when subjected to hazards of the sea and at the same time are not open to any serious commercial or financial objections.

We might note a few more points regarding the structure and equipment of ships, tending toward greater safety, before bringing this paper to a close. Ships which are required to steam through ice are protected by means of special framing and plating forward near the water-line. Suitable steering gear is a matter of great importance and is given special attention in the design of all ships. Submarine hull signals are of great importance. These signals travel faster and farther than in the air and have the added advantage that at the depth where the bell is hung the successful transmission of signals is not prevented by the heaviest gale. Ships equipped with the receiving instruments are enabled to pick up these signals from lightships when all other means fail.

The ships built today have greater strength of structure, provide greater security against the hazards of the sea and maintain a greater regularity of schedule than the ships of the past. Some of this development and improvement can be credited to the substitution of mild steel for iron and the use of high tenacity steel for those parts of the ship's structure subjected to the principal tensile stresses.

Judging by past performance we can look forward with great hope to the future. We cannot tell what tomorrow will bring forth, but progress ever moves forward and we have every right to believe that the ships to be built in the future will be the best and safest that the world has ever known.

For Better Navigation

A FEW years ago the gyroscope was ranked as a "scientific toy" and the popular knowledge of it was only spread by an occasional lecture or by means of very few books, mostly filled with obtuse formulas and dealing with it from a theoretical point of view. This, of course, was due to the fact that the only practical use made of the gyro was in naval torpedos and in laboratory models designed to measure and demonstrate the rotation of the earth, which by the way is where the gyroscope gets its name: "gyros" to spin, "scope" to see.

When the Sperry company commenced to equip the United States Navy with compasses, a school was established at the factory in Brooklyn to which men from every ship in the navy were sent for a two months' course of instruction, and later, when all foreign navies were equipped, excepting only the German, schools were opened at the foreign branch offices and factories which several thousand naval men have attended.

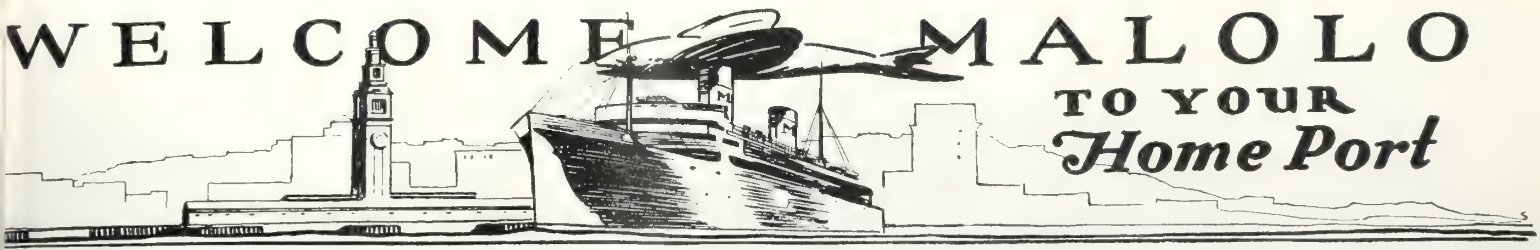
At the close of the late war the company commenced placing compasses on merchant ships and establishing additional schools at their offices in Philadelphia, Cleveland, Seattle, San Francisco, and Los Angeles. In the short space of eight years 102 merchant fleets have been gyro-compassed, besides miscellaneous craft such as train ferries, tugs, and yachts, with a corresponding spread of knowledge about the gyro, so that now it is rare to find a ship without one or more of the officers who are familiar with these true-north indicators.

Many companies now require their deck officers to have a certificate from the Sperry Gyroscope Company, and with others the man with a certificate has an additional qualification when seeking a position. Many young men just out of navigation school take a post graduate course at Sperry's, and old skippers who "haven't been to school for thirty years" but who realize that modern ships need men with modern minds, study and practice together.

The course has been simplified as much as possible. Enough theory is given to enable the student to understand the fundamentals of gyroscopic action and their application in the compass. This is shown by means of models and diagrams and involves no mathematics. The greater part of the course is given to construction, routine care, and operation, and these factors necessarily make for a better understanding of electricity and fine mechanisms in general. One or more complete equipments are available at each school for the students to dismantle and adjust as would be necessary aboard ship.

"Metal Mike" is also on display and his method of standing one long watch from port to port is explained.

The school is open to all members of the merchant marine and is without cost or obligation. The average time required for the complete course is two weeks, which may be continuous or at intervals, as convenient.



WELCOME MALOLO TO YOUR *Home Port*

OPENING a new chapter in the development of Pacific Coast merchant marine, the palatial passenger line Malolo will arrive at San Francisco November 11 (Armistice Day) and will take up her regular service between San Francisco and Honolulu on Wednesday, November 16.

On October 17, the new Matson flagship was put through her paces with speed, maneuvering, inclining, trim, and many other tests and with a 48-hour endurance run developing full 25,000 shaft horsepower.

Her Cramps-Parsons turbines, De Laval reduction gears, Babcock and Wilcox boilers, Worthington pumps, Chase tubed condensers, Griscom-Russell heat transfer apparatus, Diamond soot blowers, Westinghouse turbo-generator sets and motors, Sturtevant auxiliary turbines, Henschel engine room and pilot house indicators, Cory anti-noise telephones, Sperry shaft speed indicators, De Laval Oil purifiers, Kingsbury thrust bearings and other power equipment functioned 100% plus. In fact, she developed 25,000 sustained horsepower, corresponding to 22 knots sea speed, with steam from ten boilers, leaving two boilers idle, thus indicating 20 per cent reserve power. This test assures easy attainment of the 21½ knots average necessary for the schedule of 4½ days from San Francisco to Honolulu.

In the maneuvering and stability tests, the Malolo met and passed with flying colors every requirement of the United States Steamboat Inspection Service and of the International Safety Code for passenger vessels. The Cory-Aero automatic fire alarm system, the Rich smoke detection system, the Henschel manual fire alarm system, the Foamite fire extinguishing system, and the high pressure water mains from the fire pump proved on test that every part of the great floating structure is adequately covered with fire protection.

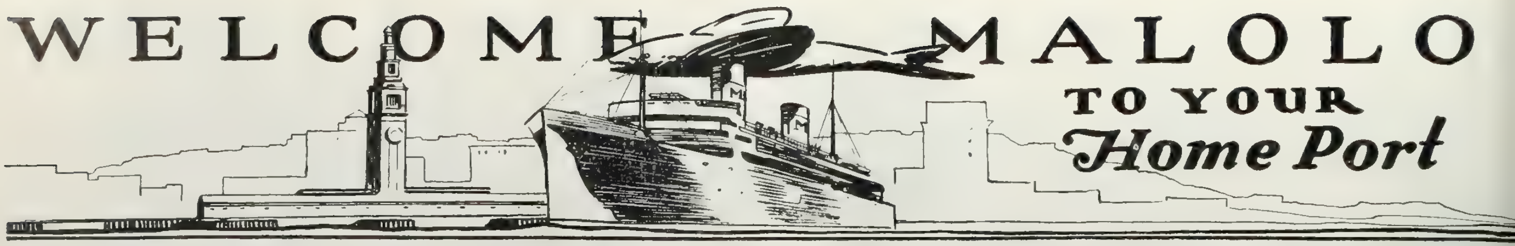
Electrically controlled, hydraulically operated, Stone system water-tight doors responded instantly to a touch on the buttons in the pilot house, closing all openings in water-tight bulkheads below the water line.

Eighteen American Brown Boveri lifeboats (two of them power boats equipped with Standard gas engines, with complete radio equipment, with electric lights, and with Exide electric storage batteries) were swung outboard from their recesses on B deck by 18 latest type Steward davits and lowered to the water level by Lidgerwood boat hoists driven by Diehl motors under the control of Cutler-Hammer magnetic brakes in less time than it takes to tell about it. These boats have sufficient capacity to handle comfortably the full complement of passengers and crew.

In the pilot house the Sperry gyro-compass and Sperry automatic helmsman did their bit to make the speed record with the least expenditure of energy by keeping the Malolo true to her course with a minimum of yaw. Check on performance of the Bethlehem steering gear was obtained through the Sperry helm angle indicator. Cory-Kent clear-view screens insured the navigator against blurring of his windows by rain, hail, sleet, snow or fog, and a Sperry high intensity 18-inch 30,000,000 beam candle power searchlight enables him to spy out his path on the darkest night.

On cutting out the turbo-generating sets, we notice just a flicker in certain of the lights and are surprised that we can still move about passages and decks under fairly good illumination. This is due to the automatic

Malolo ready for her trial run.

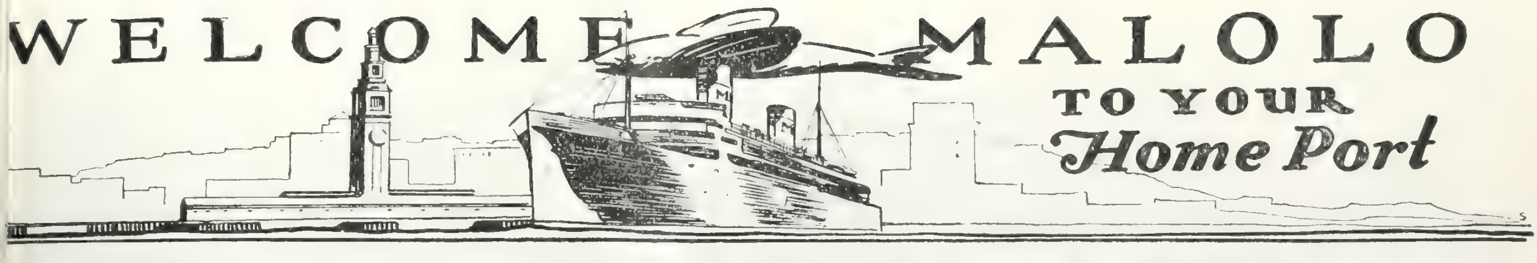


picking up of certain circuits by the big emergency Exide storage battery, which holds these lights until the Worthington-Westinghouse emergency diesel generating set can be started to provide light and power.

In short, every well proved device for safety has been provided on a vessel into whose very structure has been wrought all that the art of naval architecture can provide to make a vessel safe. So that in the Malolo we have a practically unsinkable ship, equipped with every provision to make safe the life of every person on board in case she does sink.

The Malolo is not only safe, but she is luxuriously and comfortably safe, with every device and convenience for making her passenger accommodations the equal of any first-class hotel ashore.

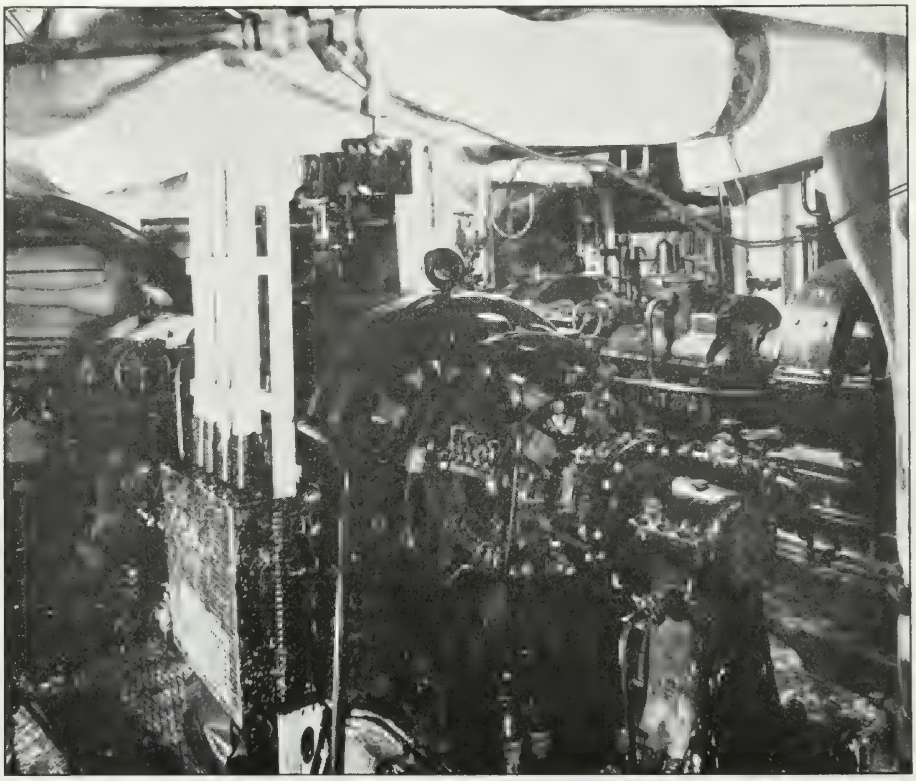
Above, promenade on C deck looking aft. The forward half of the promenade on this deck is enclosed with Kearfott windows. Lower left, one end of library. Lower right, promenade on bridge deck. This will be the favorite lounging place for those who love the sun. The raised rail enclosed central porton of this deck provides many spaces suitable for games.



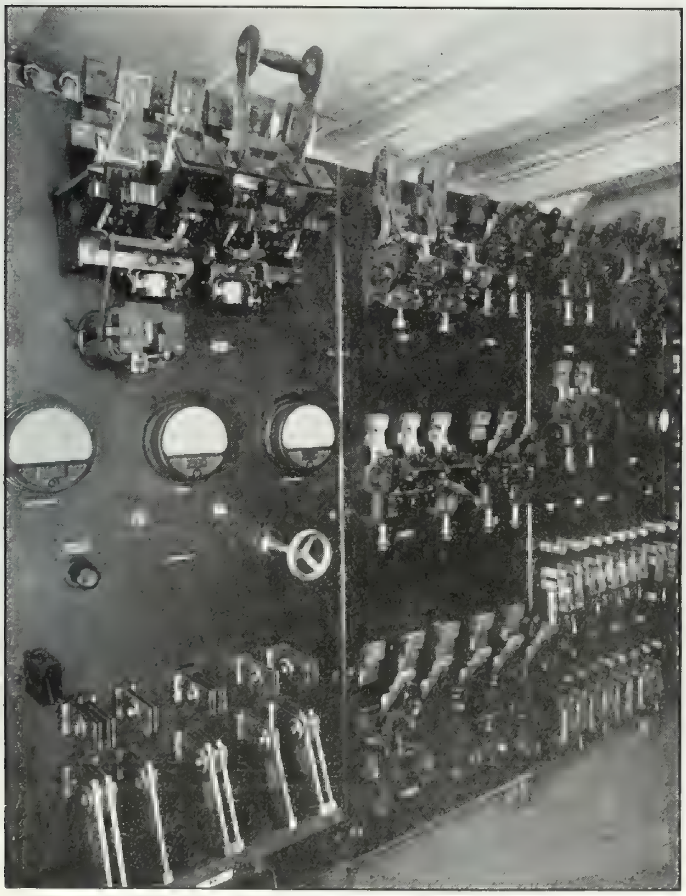
WELCOME MALOLO TO YOUR *Home Port*

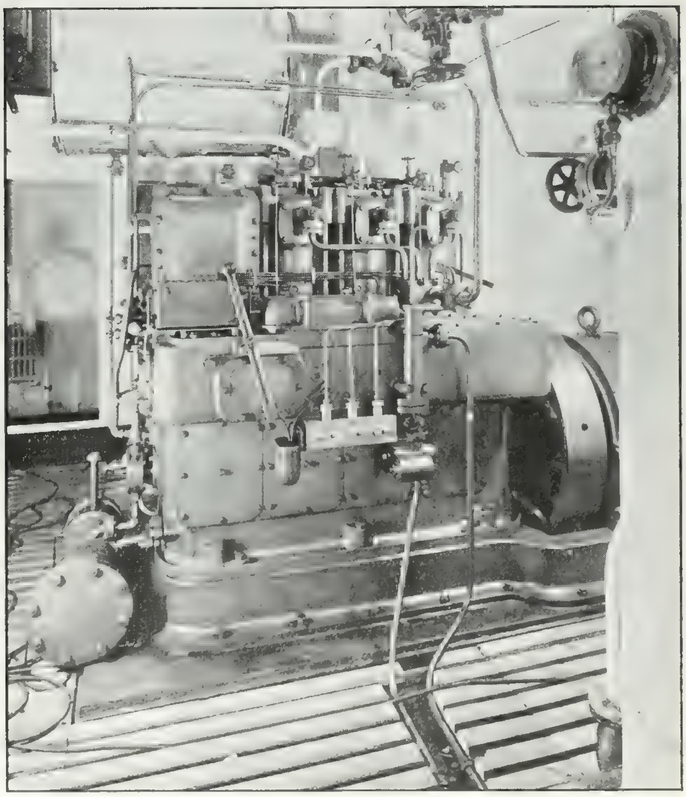
On the bridge deck there is an open, unobstructed promenade running entirely round the deck. Deck A is devoted entirely to public rooms with unobstructed promenade all around shaded by bridge deck. The rooms on this deck include library, writing room, lounge, smoking room, foyers, and verandah cafe. Decks B and C are devoted to staterooms. Deck C has an unobstructed wide promenade, the forward end being enclosed with Kearfott windows. Portions of D and E decks are devoted to staterooms and on D deck is located the great dining saloon and the galleys. The saloon will seat over 600 at one time. The swimming pool is located at F deck. Finished in marble and mosaic in Pompeian-Etruscan motif, the pool is surrounded by dressing rooms and gymnasium, electric bath, massage parlors, barber shop, and hairdressing parlors.

The Malolo is 582 feet long, 83 feet beam, 54 feet molded depth. She has an approximate gross tonnage of 18,000, net of 7500, and a displacement, loaded, of 22,000 on a draft of 28 feet



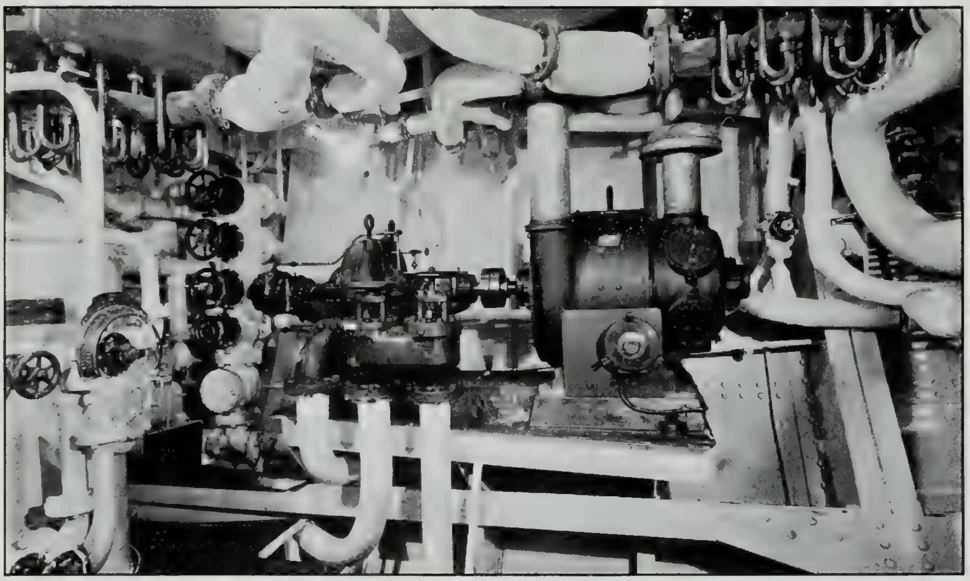
The electric power plant on the Malolo. Above, two of the four Westinghouse turbo-generating sets. Lower left, a portion of the main switchboard. Lower right, the Worthington trunk-piston type, 50-horsepower diesel Westinghouse generator emergency lighting set.





6 inches. Dry cargo caparity is 200,000 cubic feet, refrigerated cargo 21,000 cubic feet, fuel oil capacity 4600 tons. Shaft horsepower of 25,000 on ten boilers gives her 22 knots speed, and with her other two boilers on she can easily make 23 knots when a spurt is needed.

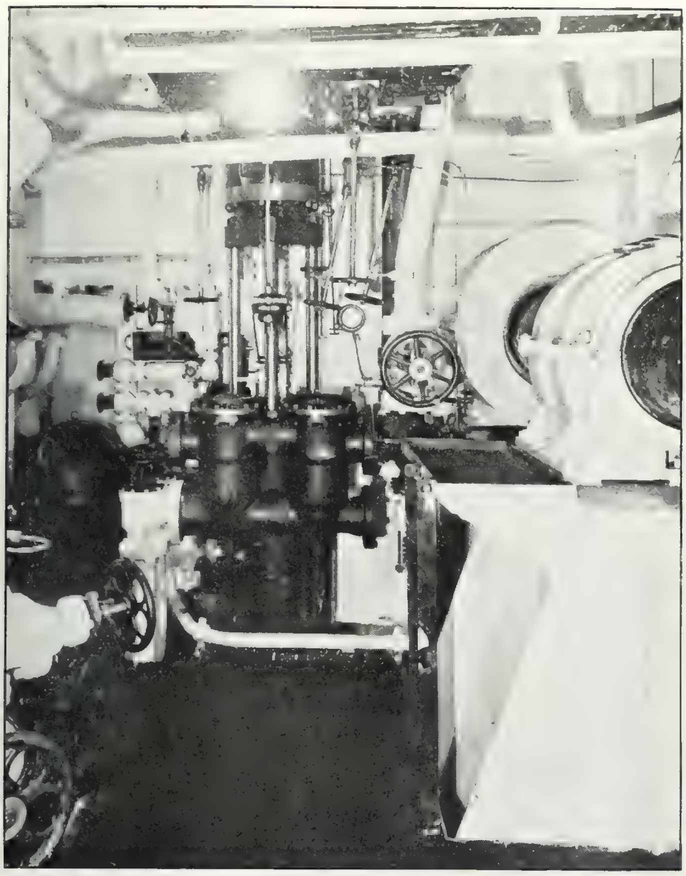
This great speed will enable the Malolo to make a round trip from San Francisco to Honolulu every two weeks. San Francisco to Honolulu, 4½ days; in port at Honolulo 2½ days; Honolulu to San Francisco 4½ days; in port at San Francisco 2½ days. This schedule will practically double the passenger carrying capacity of the Matson Navigation Company.



Above, a group of Westinghouse motors driving ventilating fans for the engine room. This group is located on the bridge deck. At left, Worthington centrifugal fire and sanitary pump driven by Westinghouse motor. Below, Worthington centrifugal main feed pump driven by Sturtevant steam turbine and Worthington vertical simplex 7 by 8 by 12 fresh water pump.

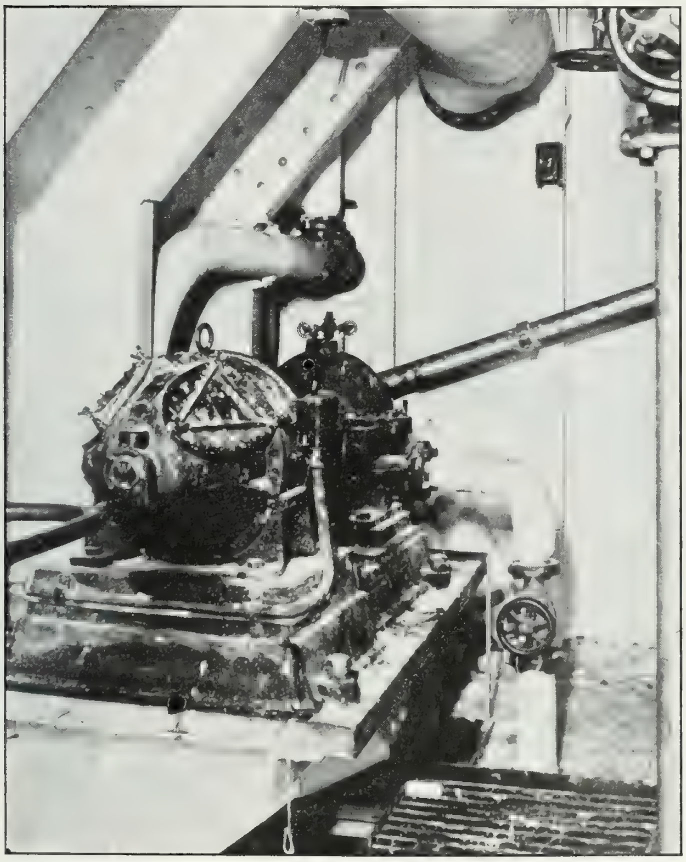
Malolo on the run will enable Matson Navigation Company to completely overhaul and recondition passenger accommodations on the Matsonia and the Maui without reducing present passenger capacity. With these two favorites modernized in every particular, Matson will offer the finest American coastwise passenger service on any ocean. Nine splendid steamers, Malolo, Maui, Matsonia, Manoa, Wilhelmina, Lurline, Sierra, Sonoma, and Ventura, will make possible one or more sailings for every week in the year.

Aloha, Malolo! California bids you welcome!

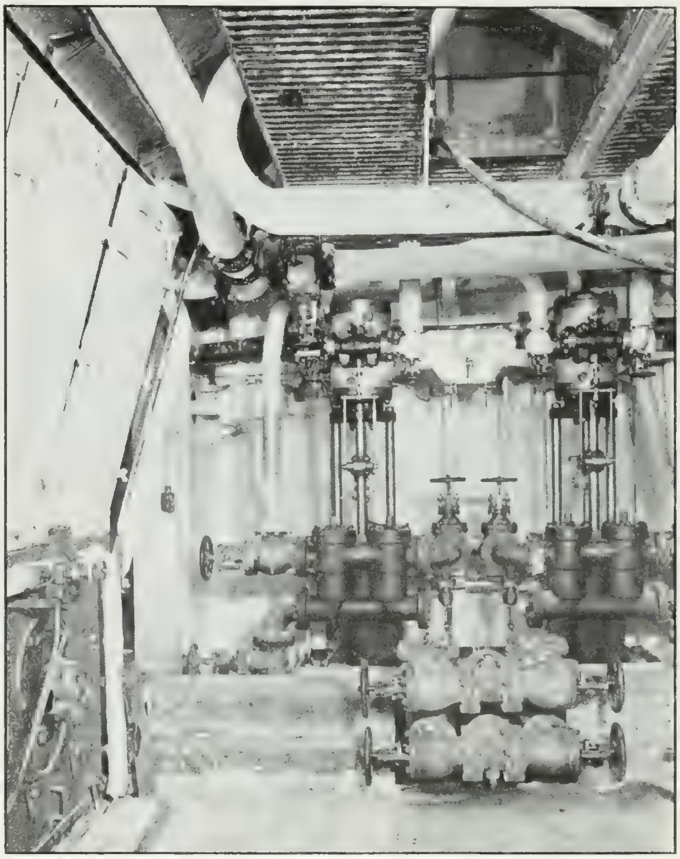


Worthington vertical simplex 16 x 11 x 24 auxiliary feed pump on the after bulkhead of the engine room.

View on sun deck showing wide promenade and game spaces and featuring two Westinghouse motor driven hull ventilating blowers.



Close-up of Westinghouse motor driven Worthington centrifugal pump in a corner of the engine room.



View in boiler room showing two Worthington vertical simplex 9 by 6 by 15 fuel oil service pumps and a corner of the front of one of the twelve Babcock & Wilcox boilers.

Malolo's Most Modern Galley

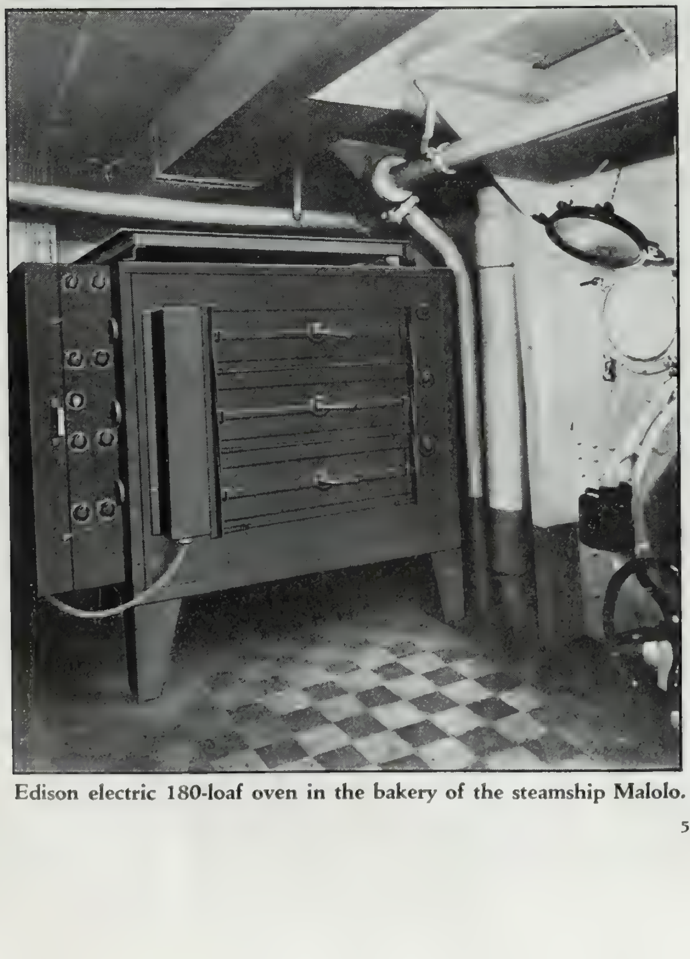
Twelve Hundred Persons Served Daily Using Electric Cooking and Baking Equipment

By P. H. Vivian

THE most modern galley afloat is on board the new Malolo, the most beautiful passenger liner which has ever been built anywhere in the world. Up-to-date in every respect, she is completely electrified as to cooking equipment.

The Malolo uses only 218 square feet of deck space for her electric equipment to cook and bake. This is a record for serving so many persons. But the galleys are not crowded and excellent working conditions obtain throughout. The designers of the Malolo did not gamble on her equipment. The best of everything was chosen for its individual purpose. Servicing at sea is a difficult matter and all equipment must be built to withstand the heaviest service with the least maintenance. This is especially true of cooking and baking equipment, for so much depends upon the dependable performance of this class of equipment. This is necessary for very obvious reasons.

Calrod is responsible for this dependence on the Malolo's electrical cooking and baking equipment. The historical path on which high temperature cooking equipment had to travel was very rocky until the development started on Calrod. From that time on, progress was very rapid until the final construction of nichrome resistance wire in the form of a helical coil, suspended and centered in a steel tube entirely surrounded with finely divided, densely packed, refractory insulation. One of the secrets of the success of Calrod is due to the fact that this insulation is capable of withstanding extremely high temperatures and at the same time excluding air and foreign materials from attacking the resistor.


Edison electric 180-loaf oven in the bakery of the steamship Malolo.

The tubes or units are formed into suitable shapes for the various purposes for which they will be used. They are then cast in the unit body such as the heavy duty range top or under-fired broiler unit. For the oven and broiler units the Calrod tubes are simply formed into the shapes required and placed in unit frames.

Though subjected to the most severe uses Calrod units stand up indefinitely. There are many cases where Calrod has withstood heavy service for a period of as many as twelve years without any appreciable deteriorating affects. It is for this reason that the United States Government has practically standardized on Calrod equipped heavy duty devices for submarine and battleship galleys.

Another excellent advantage of the Calrod unit is that there is absolutely no danger from spill-over for the heavy terminals come out of the unit at the end of the tubing beyond the exposed part and these are covered with a metal spread plate. The heat generated in the resistor is conducted speedily and uniformly directly to the point of application. This rapid dissipation prevents over-heating and protects the unit coil positively against oxidation.

Ranges and Broilers

Among the pieces of equipment on board the Malolo which are equipped with Calrod units are eight heavy duty ranges, 22 kilowatts each, installed in the main galley. There are two banks of four each placed back to back, with clear passage all around as shown in the illustration. This advantageous arrangement is possible because electric equipment may be placed anywhere without attention to ventilating problems.

In addition to the ranges there are two large broilers of 10 kilowatts each which have adjustable grids located below the Calrod units and equipped with grease funnels and warming compartments. A conveniently operated sliding device enables the proper location of the meat grid with respect to the units.

The framework of the ranges is of heavy steel, welded and brazed, supporting a steel top 48 inches long by 39 inches deep and is 31 inches high. The ranges are all equipped with adjustable sea-racks. The cooking surface of each range is formed with four cast-in Calrod hotplates, each 9 inches wide by 24 inches long, supported independently on a steel framework so that the weight of the cooking utensils comes on the framework itself and not on the range top. Each hotplate has a rating of 4 kilowatts and the terminals have brazed lead connections to three-heat, heavy service, rotary snap switches so that the effective operating load is 4 kilowatts, 2 kilowatts and 1 kilowatt respectively for the three heats.

When the switches are turned to the high position, the hotplates readily heat to cooking temperature but the heating is uniform due to the fact that the units are cast into the hotplates. Each plate is built to withstand the weight of 1000 pounds and will not warp nor sag, having a level surface and smooth cooking top. They can be heated to a temperature of a high as 1000

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degrees Fahrenheit—bright cherry red—without danger of burnout or warping.

This brings up another advantage of the Calrod equipped electric range. Each hotplate is a range within itself, permitting a diversity of cooking operation, so that each individual range is at least 30 per cent. more effcient than that operated with flame fuels. Thus, very valuable deck space is conserved in the galley.

In each range is an oven 21½ inches wide by 26½ inches deep with a height of 18 inches. The walls and oven door are all insulated with rock wool. The oven is equipped with top and bottom Calrod heating units, each rated at 3 kilowatts and controlled independently by three-heat, heavy service, rotary snap switches, the heating units covering the entire top and bottom areas of the oven. Each unit is separately fused.

The crew's galley of the Malolo has two sections of these ranges which are of the same type as those in the main galley.

The complete range and broiler equipment, having a capacity to cook for 1,200 persons, occupies only 100 square feet of deck space.

Bakery

In the bakery there are two electric ovens, each having three decks. The bread baking oven has a connected load of 25 kilowatts and the pastry oven is rated at 9 kilowatts. While the design and construction of these ovens are somewhat similar they are different as to capacity. Different baking temperatures are permitted in the various compartments at the same time, thus again conserving deck space. Oven linings are all of heavy steel surrounded by rock wool insulation with a minimum of through metal from the lining to the outside wall. Each baking compartment is equipped with a deck made of heavy 1 1/8-inch tile and is equipped with bi-metallic temperature thermometers. Each compartment is also lighted so as to completely illuminate all parts of the baking chamber. The shelf-type doors are equipped with a latching mechanism which makes possible a steam tight baking chamber when the doors are closed.

The Malolo's bread baking oven has a capacity of 270 one-pound loaves per hour and the pastry oven has a loading capacity of six 18 by 26-inch roll pans. The connected load of these two ovens together is only 34 kilowatts. They will turn out all of the daily baking requirements for superb dining service rendered to 650 passengers as well as for the entire operating personnel.

The main pantry and steward's pantry are equipped with electric griddles, urns, and hotplates.

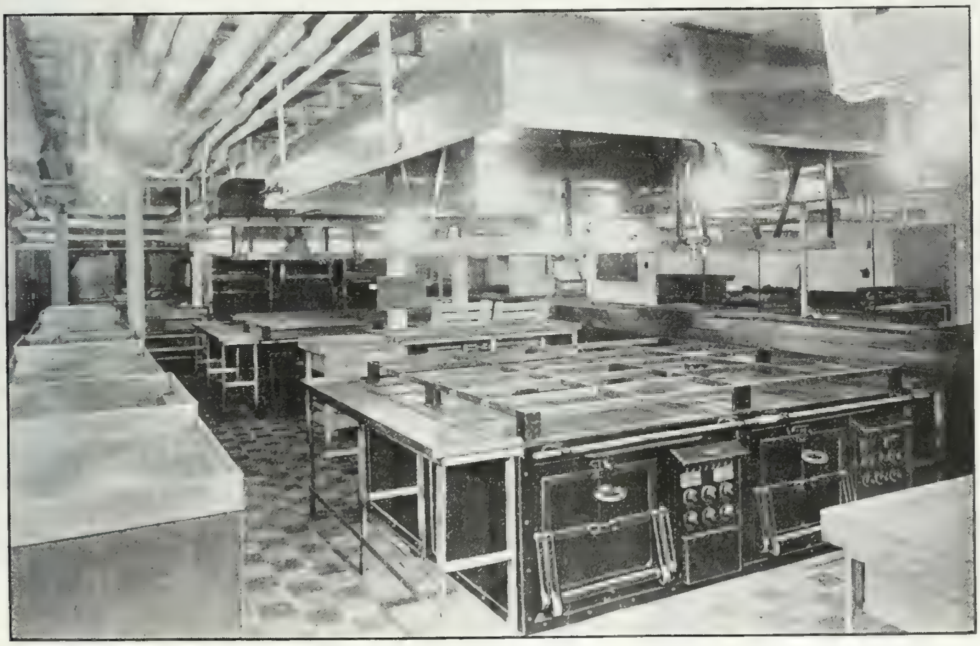
The Malolo has a total electric galley load of 220 kilowatts. This will amount to approximately 35 per cent. of the total electric demand. This load will operate largely on the "off-peak" period, as most of the baking is done either after midnight or in the early morning hours, and most of the heavy cooking is done from early morning to late afternoon, so that by the time the lighting load comes on, practically all of the cooking is out of the way. Thus a very favorable diversity factor is obtained.

A separate switchboard panel has been provided for the galley thereby enabling a separate metering system and individual cut-outs and master switches for each unit of equipment. All the current consumed can be thus accurately measured, and records are expected to bear out previous experience that the energy consumption should not exceed 3 kilowatt hours per day per person fed. This means a very low cost of galley operation due to the off-peak type of load previously described, the economical generation of power, and the low overhead and upkeep as compared with other types of cooking equipment.

Electric equipment is built to withstand the heaviest service. When a ship is at sea there is no possibility of replacement of defective parts with the exception of small items which may be carried in stock. Therefore, the equipment must be thoroughly dependable in every way. The steamship Republic, of the United States Lines operated her electric galley for over six months with Calrod range units at red heat constantly 24 hours a day and experienced no break downs. This is the most severe test ever known to be made on any kind of galley equipment in the history of sea-going vessels. The steamship Leviathan, steamship Maui, U. S. S. Nevada, and many other ships are equipped with Calrod range units.

When the creation of the Malolo was conceived by the Matson Line officials and the designing and engineering were entrusted to William Francis Gibbs, President of the Gibbs Brothers, Inc., New York, it was stated that this ship would be the peer of the great fleet of beautiful passenger vessels which have been launched the last few years, and she is.

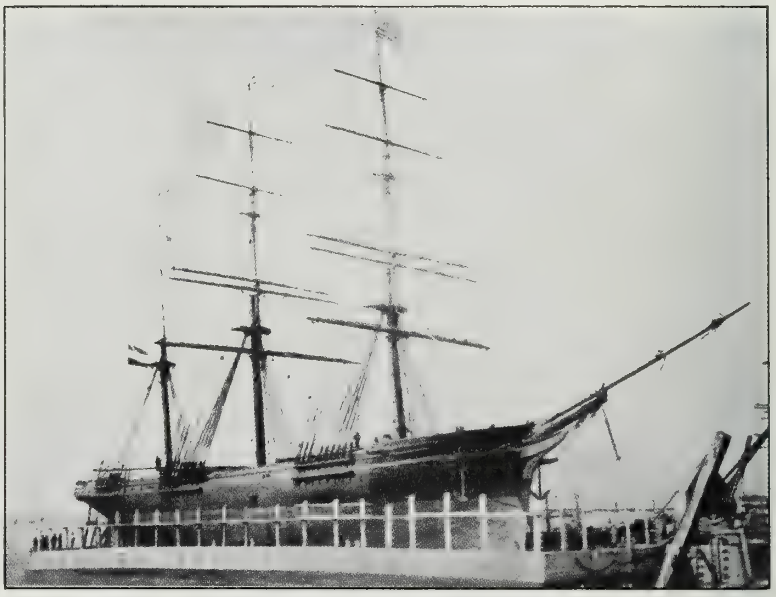
The Malolo will be noted for many things. Her superb construction, her tasty and luxurious accommodations, her great speed, and not least for her superior meal service. This is as it should be, for the Malolo is one of the finest passenger liners afloat and food for her passengers will be prepared in a clean and modern electrical culinary department—**the most modern galley afloat.**



Main galley of steamship Malolo showing eight Edison electric heavy duty ranges in two banks of four each, and, in the background, two Edison electric heavy service broilers. This equipment cooks for 1200 persons.

History of the Once Famous Clipper Ship Golden State

By F. C. Matthews.



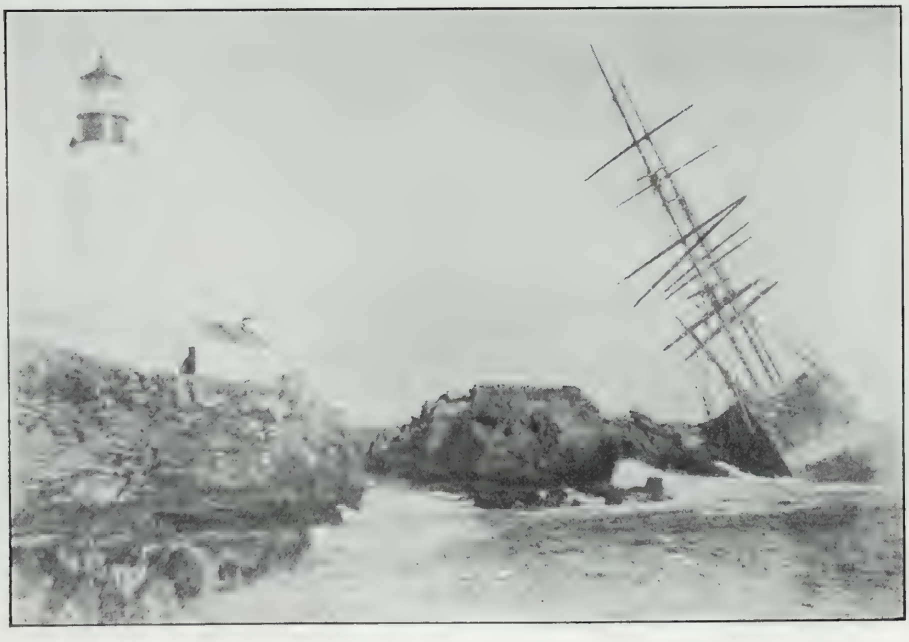
The Anne C. Maguire, formerly the clipper Golden State, on dry-dock at Quebec in 1884.

THE Golden State was one of the best known and most popular vessels of the clipper fleet engaged in trade with San Francisco and China, and her active career therein covered thirty years. She was built by Jacob A. Westervelt at New York and launched January 10, 1853, with a portion of her cargo for San Francisco then on board. Her registered tonnage, old measurement, was 1364, but her model was so sharp that her actual deadweight carrying capacity was hardly 1200 tons. For many years she was owned by A. A. Low & Brother of New York, whose large fleet of extreme clipper ships also included the Great Republic, Jacob Bell, David Brown, N. B. Palmer, Contest, and Surprise.

On her maiden voyage the Golden State established a reputation for speed which was thereafter consistently maintained. Leaving New York February 8, 1853, she soon came up with the ship Northern Crown, also bound for San Francisco, and in eight hours had left her out of sight astern. The following day, the Ariel, a China trader with quite a name for speed, met a similar fate. On the ninth day out the Golden State ran 327 miles under royals and everything appeared propitious for a fine run to the line. However, during the night of the tenth day, a sudden squall stripped her of all three topmasts, and Captain Doty was forced to make Rio de Janeiro to refit. This being completed, the voyage was resumed and in spite of the fact that she was 26 days off Cape Horn and experienced very light winds in the North Pacific, she made the Golden Gate in 96 days from Rio. Later she crossed to Shanghai and arrived at Deal February 9, 1854, in 94 days from Woosung. From London, she crossed to New York in 29 days, in ballast.

The second voyage of the Golden State was 125 days from New York to San Francisco, she being within 700 miles of destination for ten days. Then crossed the Pacific to Shanghai in 42 days and was 88½ days from the latter port to New York. The third voyage was 90 days from New York to Hong Kong; 105 days from Foo Chow to New York. The fourth was over the same course, 93 days on both outward and homeward passages. On this latter run she passed the Cape of Good Hope in 31½ days from Java Head, which for that season of the year had then been beaten only by the Challenge, one of the fastest ships ever built.

The fifth voyage of the Golden State was outward to China; then a side voyage to Bangkok and one to Australia. On the return to New York she reached port



At the left, our illustration shows the Anne C. Maguire stranded on Cape Elizabeth, December 1886. Above, a close up of the inscription on the rocks at Cape Elizabeth.

on March 2, 1860, in 84 sailing days from Hong Kong, 41 days from the Cape of Good Hope. Near Mauritius she had spoken the clipper ship Electric Spark and led her into New York three days. She then went to San Francisco from New York in 128 days, light winds prevailing throughout the run, but this long passage was offset by her very fast return trip, 94 days, San Francisco to Cork, with wheat.

The Golden State was thereafter operated between New York and China or Japan, except in 1863, when she was diverted to San Francisco for one passage, her time from New York being 121 days. A particularly fast round voyage was that of 1867-1868, when her time from New York to Hong Kong, thence to Amoy, then back to Hong Kong and return home, was inside of eight months, including all detentions. In November, 1872, she reached San Francisco after the very fast run of 34 days from Shanghai, and then went to New York in 107 days.

In January, 1883, the Golden State, then rigged as a barque, left New York for Anjer and China. Encountering very heavy weather in the North Atlantic, she sprang a leak and Captain Berry was forced to put into Rio in distress. The cargo was discharged and after the vessel was surveyed she was sold to D. & J. Maguire of Quebec, whose fleet then included several other American-built ships. Her new owners renamed her Anne C. Maguire and put her under the Argentine flag, her hailing port becoming Buenos Aires. She was operated in the Atlantic until December 24, 1886, when she went ashore near Portland Head lighthouse, Cape Elizabeth, Maine. Within two weeks she had broken up and gone to pieces.

Our illustrations show the Anne C. Maguire on dock at Quebec in 1884, after her arrival from South America. Also her appearance while stranded at Cape Elizabeth in December, 1886, and a close-in view of the scene of the wreck with memorial inscription on rock.

Painting by C. R. Patterson

"In Their Last Harbor."
(Barks B. P. Cheney, Pactolus, St. Katherine, and Hecla.)

They lean, as if for comfort, mingling spars
And gossip idly neath the waning stars
Of gales that might have blown. The tides
Flood and recede within their hollow sides.

(From a photograph loaned through the courtesy of Captain W. F. Lee, Largs Bay, South Australia.)

The bark Pactolus in her prime.

Sic Transit Gloria Mundi

IN CONTRAST with her appearance as one of the fleet of old sailing ships in their last port near Antioch, California, as depicted herewith by the famous marine artist, Charles R. Patterson, we present a view of the bark Pactolus in her prime. It is now announced that the five vessels shown have been sold and are to be broken up or burned for the metal used in their construction.

The Pactolus was built by John McDonald at Bath, Maine, and was launched September 26, 1891. She cost $89,000.

At first she was engaged in general trade, making several passages from New York to Portland, Oregon, taking wheat thence to Europe.

When eastern shipowners were turning their attention from sail to steam, about 1900, the Pactolus and many other fine vessels were sold to parties in San Francisco, who organized the California Shipping Company to operate their vessels mainly in trade in the Pacific Ocean.

Eventually most of the fleet were purchased by various salmon packing companies for use in connection with their plants in Alaska, taking supplies and cannery hands north in the spring, returning to their home port in the fall with the pack.

Ultimately being replaced by steamers, their usefulness was at an end and they were laid up.

Now the dealers in junk are tearing at the vitals of these old friends and they are to be burned at the stake, drawn and quartered, to salvage a few pounds of copper and iron.

Purchasing A Diesel Engine

By C. G. A. Rosen

TODAY is a buyer's market in the diesel engine business. Price very often appears to be the deciding factor in the selection of a diesel engine. Certainly, the great number of concerns manufacturing diesel engines at the present time has made competition keen and has empowered the purchasing authorities to demand "pencil sharpening" and price cutting. This condition has forced engine salesmen to bend their efforts toward "selling" a highly engineered product to nontechnical and pseudo-technical individuals (because they are vested with power to buy), rather than endeavoring to create confidence in open minded engineers by co-operative investigation of fundamental principles and established performances.

The diesel engine is an engine of highly refined details developed through years of operating experience by close observation and consistent improvement. It would, therefore, seem logical to choose a diesel engine on the basis of engineering judgment gained through experience, rather than on a first cost or price per horsepower basis. Price per horsepower is of absolutely no value for comparative purposes, unless the engines under investigation are rated and analysed upon a common basis of "equivalent engines." First cost is of consideration only when including the total value received in the purchase price.

Price Per Horsepower

To illustrate why price per horsepower on quoted engine prices is a false basis for comparison, observe the analysis made in Table I.

In this table, two makes of 300 brake horsepower marine diesel engines are quoted at $23,700 for engine "A" and $21,500 for engine "B." On the basis of these quoted prices, engine "A" is offered at $79 per brake horsepower and engine "B" at $71.67 per brake horsepower. Engine "A" would appear to be $2200 higher than engine "B." This fact is true only when considering that both engines are normally 300 brake horsepower engines.

Columns 1 and 2 in Table I list the various characteristics of each engine. By investigating a number of engines of this horsepower for marine service, it would be noticed that the mean indicated pressure average 105 pounds per square inch and the piston speed 750 feet per minute. The first figure indicates the safe loading of the engine cylinders and the second figure shows the rate at which the loading is dispersed.

It would seem fair to apply these two figures to the two engines under consideration. Both engines could then be termed "equivalent engines" or engines of average standard practice for the same service requirements.

Upon rerating both engines on the basis of "equivalent engines," we find a difference in horsepower output which gives engine "A" a rating of 314 brake horsepower and engine "B" a rating of 284 brake horsepower, as shown in columns 3 and 4 of Table I.

On the basis of the new ratings, engine "A" is actually valued at $75.47 per brake horsepower as a 314 brake horsepower engine, and engine "B" is valued at $75.70 per brake horsepower as a 284 brake horsepower engine. In other words, when rated as "equivalent engines" (i.e., able to perform the same service with the same overload capacities as determined by satisfactory performance in practice) both engines have practically the same cost per effective brake horsepower. A purchaser would be buying more value when purchasing engine "A" than he would receive in purchasing engine "B." Engine "A" could be relied upon to produce more than 300 brake horsepower continuously, while engine "B" would be constantly forced in endeavoring to produce 300 brake horsepower. The economy of proper analysis in such price comparisons is self evident.

TABLE I

COLUMNS:	1	2	3	4
ITEM	QUOTED "A" ENGINE	QUOTED "B" ENGINE	RERATED "A" ENGINE	RERATED "B" ENGINE
Cycle	4	4	4	4
Bore	12	11-1/2	12	11-1/2
Stroke	17	17	17	17
No. Cylinders	6	6	6	6
B. H. P.	300	300	314	284
M. I. P.	104	107.2	105	105
Piston Speed	737	780	750	750
R. P. M.	260	275	265	265
Price	$23,700.00	$21,500.00	$23,700.00	$21,500.00
Price Per BHP	$ 79.00	$ 71.67	$ 75.47	$ 75.70
Service	Marine	Marine	Marine	Marine
Fuel System	Solid Injection (Common Rail)	Solid Inj. (Common Rail)	Solid Inj. (Common Rail)	Solid Inj (Common Rail)

Value Received

When purchasing a diesel engine, what is included in the first cost? The total value received by the purchaser may be said to include both tangible and intangible qualities. The intangible qualities are perhaps the more important because they determine the ultimate cost of the engine. The tangible qualities may be anticipated by guarantees and proved on the engine builder's test stand. The intangible qualities, however, are woven into the fabric of the product as the inevitable consummate result of the manufacturer's background of experience and the policy of the manufacturer during the engine construction. The purchaser, therefore, obtains a product which reflects the character and ability of the builder. He obtains a result of evolutionary engineering processes in internal combustion engine practice. The origin and trend of this evolution, as they affect the history of a diesel engine manufacturer, are intangible qualities of great importance to the purchaser. The first and most important factor in selecting a diesel engine is therefore the status of the manufacturer of the engine. Unless one is buying a diesel engine on speculation or trial, it behooves the purchaser to investigate the manufacturer's history. Has he produced engines of high caliber that have made good performance records? Has he advanced or contributed to the diesel engine industry?

Maintenance Costs

A diesel engine manufacturer's record of maintenance costs is his standard of achievements. The ultimate value of any engine is indicated by its low maintenance costs. A diesel engine may defeat its native economy by high maintenance costs. High maintenance in most cases is a result of improper selection of engines. Poor operation and lax upkeep will surely affect maintenance, but an engine intended for one purpose can never operate at best economy in a service for which it is not qualified. Complete certified maintenance costs records, are the best salesmen for diesel engine manufacturers.

Technical comparisons may lead to all sorts of ramifications. The number of carefully designed minute details which go toward making up a diesel engine could be investigated to the very limit. However, unless the purchaser is intimately acquainted with diesel engine design, such detailed investigation might only lead him astray and confuse him in his selection. To the initiated, the design of the piston is usually a criterion of the general care exercised in the design and construction of a diesel engine. In the long run the maintenance cost record tells the real story.

A diesel engine is primarily a mechanism for producing power by burning fuel within a cylinder. It is essential, therefore, that the engine successfully accomplish combustion with a clear exhaust. If the engine will not burn fuel properly, high grade machine work will not compensate for this defect. Poor combustion is the root of most evils in diesel engine operation. The purchaser should determine the ability of the engine to burn fuels of his choice with a clear exhaust.

In comparing various diesel engines, the horsepower output should be determined on an equitable basis. There is a very apparent need for some standard form of rating which will permit the purchaser to determine comparative horsepower ratings. Two engines of similar type are said to be "equivalent engines" when they have identical indicator cards and the same piston speeds. It is, therefore, quite simple to rerate engines of similar types on this basis as shown previously in Table I. Where engines of different types must be compared they can be classified according to the fuel system, cycle, and scavenging system. Where a large number of engines is under advisement for purchase, each can be placed in a classified group according to the items just enumerated. The engines in each group should be rerated on the basis of identical indicator cards and the same piston speeds. All of the groups can then be compared with one another on a standard equitable bases.

In Table II, engine "X," a 2-cycle air injection engine, quoted on 1100 brake horsepower at a price of $75,000 is compared with engine "Y," quoted on 1100 brake horsepower at a price of $53,500. Engine "Y" is 30 per cent lower in price than engine "X." Engine "X" was rerated according to engines of the same class and an average condition of 85 pounds mean indicated pressure and 900 feet piston speed were established. Engine "Y" was compared with other engines of its class and type and a mean indicated pressure of 95 pounds and a piston speed of 950 feet per minute were established. It can be seen that on a rerated basis, engine "X" is capable of developing 1296 brake horsepower, while engine "Y" will develop with safety 780 brake horsepower. The price per brake horsepower on the quoted engines was $68.18 for engine "X" and $48.63 for engine "Y." On a rerated basis, engine "X" is valued at $57.87 per brake horsepower and engine "Y" at $68.58 per brake horsepower. This analysis reveals a change in valuation on the basis of rerated engines.

The details of lubrication, bearing pressures and design of minute parts very often establish a successful performance record for a diesel engine. Records of similar engines, reveal the status of these details of design.

Summarizing, it may be said that most vital points in comparing diesel engines are taken care of on the basis of:

1. Character and ability of manufacturer.
2. Purpose and intention of engine.
3. Maintenance record.
4. Technical comparisons:
    (a) Fuel system.
    (b) Rating.
    (c) Analysis of details.

TABLE II.

COLUMNS:	1	2	3	4
ITEM	QUOTED "X" ENGINE	QUOTED "Y" ENGINE	RERATED "X" ENGINE	RERATED "Y" ENGINE
Cycle	2	4	2	4
Bore	15"	18"	15"	18"
Stroke	23"	26"	23"	26"
No. Cylinders	8	6	8	6
B. H. P.	1100	1100	1296	780
M. I. P.	80.5#	110.5#	85#	95#
Piston Speed	882	1150	900	950
R. P. M.	230	265	235	220
Price	$75,000.00	$53,500.00	$75,000.00	$53,500.00
Price per BHP	$ 68.18	$ 48.63	$ 57.87	$ 68.58
Service	Marine Elec.	Marine Elec.	Marine Elec.	Marine Elec.
Fuel System	Air Inj.	Solid Inj.	Air Inj.	Solid Inj.
Scavenging	(Cont.Port Scavenging	-----	Cont.Port Scavenging	-----

Modern Cargo Cranes

Types Available, Factors Governing Selection, and Latest Developments

By Bernard Dunell*

THE term "cargo" covers all sea-borne merchandise and may be sub-divided into:

1. Bulk cargo—grain, coal, ore, timber, oil, or any other commodity, only one of which is carried by the ship on any particular voyage.
2. General cargo — merchandise of all kinds, either packed in containers, baled or handled loose, a great variety of materials going into the making of one cargo.

It is the intention of this paper to deal only with dock cranes as applied to the handling of general cargoes and not to include any of the special class of appliances which have been devised for loading and unloading bulk cargoes.

Handling of General Cargo

Diversity of shape, size, and weight precludes the possibility of using elevators or conveyors to any great extent, while the necessity of sorting and piling in alloted places on the wharf makes the transporter, with its rather limited area of discharge, unsuitable.

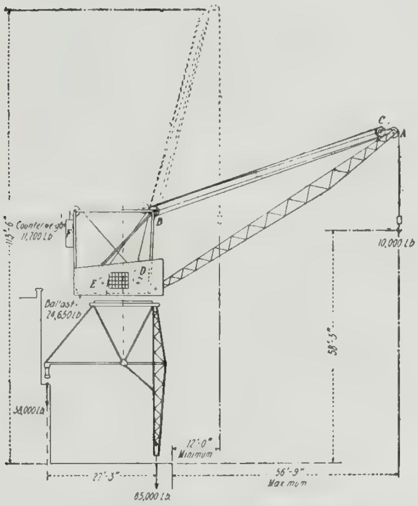


Fig. 2 Level-Luffing Type of Crane with Special Reaving of Hoisting Rope in Conjunction with Particular Arrangement of Centers of Jib-Head Sheaves, Fixed Sheaves on Superstructure End of Jib-Foot Pivot

In selecting the most economical crane for handling general cargo it must be borne in mind that individual pieces will vary in weight from a fraction of a ton up to perhaps 50 tons or over. The question then arises: What is the most economical capacity of crane to use? This question cannot be answered with any certainty, as no one can foretell what the average weights to be handled will be. It can be stated, however, that the most popular general cargo cranes in use at present are of from three to five tons' capacity. Loads above this are not so very frequently encountered, and should be handled by ship's gear or by a heavy-lift crane with which every port of any magnitude should be equipped.

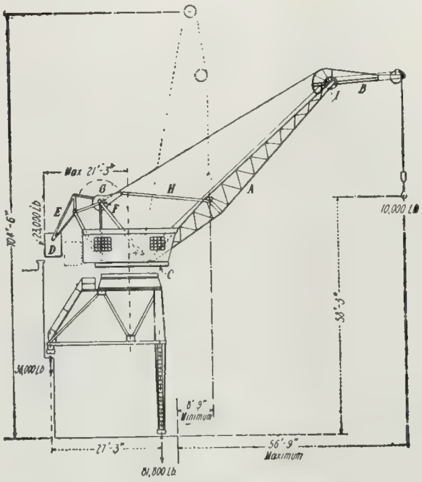


Fig. 1 Level-Luffing Type of Crane

In addition to considering the different weights which have to be handled, the great variety of sizes must be considered. This does not apply so much to case or baled goods, but is particularly noticeable as regards the type of crane to be adopted when it comes to loading or unloading such material as steel rails, structural sections, iron rods, and long timbers. In lifting material of this nature into, or from, the hold of a ship it is necessary to place the slings in such a fashion that the load will assume a more or less vertical position when lifted. The result is that a good portion of the load will project above the hook, and when in its highest position will project above the hoisting pulley.

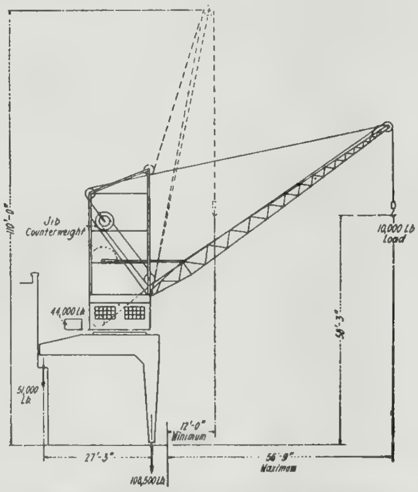


Fig. 3 Level-Luffing Type of Crane with Counterweight Arrangement for Paying Out Required Amount of Rope to Give Level Luffing

In the case of derricking jib cranes, either level luffing or otherwise, this is not important, as the jib swings with the load; but with the transporter or straight-line crane, that portion of the load projecting above the trolley path is in danger of fouling the boom as the trolley is racked in or out. A slight shock to a bundle of rails, rods or angles will often cause the load to slip through the sling.

A further point to be considered in the handling of general cargo lies in the fact that different consignments are often loaded promiscuously into the sling nets and have to be sorted as to marks and numbers when landed on the wharf so that each consignment can be piled in its allotted place in the sheds or on the dock. Then again, it may be required to take one class of material from one part of a ship's hold and another class from a different part of the same hold and deliver the loads alternately to two separate shed doors. In order that the same crane may be capable of this duty it should have a wide area of pick-up and discharge without delay being occasioned in reaching these areas.

An important consideration in selecting a wharf crane is the wheel loads which the structure of the wharf will be subjected to. As will be seen from the accompanying

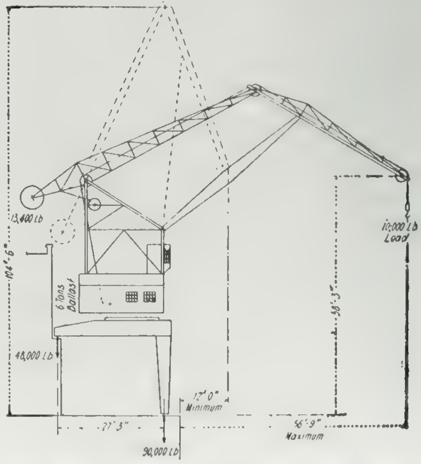


Fig. 4 German Design on Order of Pantograph with Level-Luffing Feature

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*Abstract of paper read by Bernard Dunell, manager, C. C. Moore & Co., Vancouver, B. C., before the Regional Meeting, The American Society of Mechanical Engineers, Seattle, August 29 to 31, 1927.

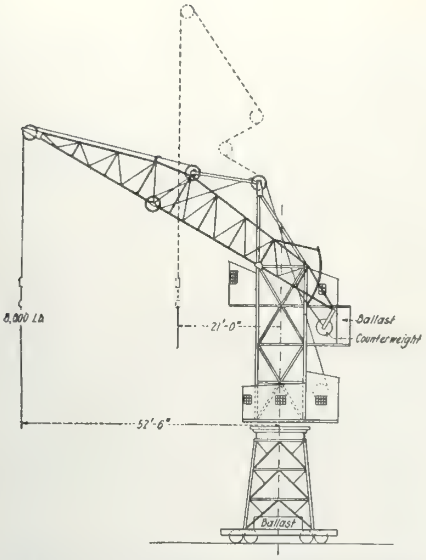


Fig. 5 Crane in Which Luffing Is Accomplished by Means of Pinions Engaging in Segmental Racks on Each Side of the Jib

illustrations, these wheel loads may vary to a very considerable degree in different makes of cranes, although they may be of the same capacity, outreach and rail gauge. These wheel loads are not quite so important in determining the selection of crane in cases where a new wharf is to be built, as provision can be made for whatever loading is required, but in cases where cranes are to be installed on existing wharves great care must be taken to see that the maximum wheel loads will not be in excess of the safe working loads. In any case the crane with the smallest wheel loads, other things being equal, has a decided advantage over others. Any additional strength to a wharf or building, whether new or otherwise, required by reason of the wheel loads it is subjected to should be debited against the crane when selection is being made.

The hoisting rope of a modern cargo crane should lift on a single fall of rope, even when dealing with loads as high as five tons, as the handling of a snatch block in the hold of a vessel is a clumsy and aggravating process and is strongly objected to by stevedores and laborers.

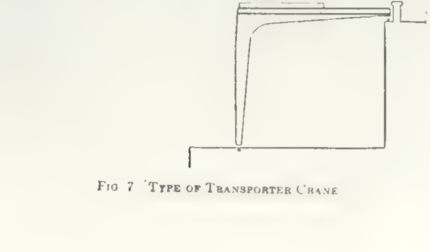


Fig 7 Type of Transporter Crane

In spite of the fact that up to quite recently wharf cargo cranes did not show much advantage as to speed over ship's gear, they still formed a very important part of the dock equipment of many large ports. One of the principal reasons for this being that, provided wharf cranes are available, a ship on arriving at her home port for discharging is not under the necessity of keeping up a head of steam, with all the attendant expenses, simply for the purpose of working the cargo winches. Bearing this in mind, and remembering that up to 1921 nearly 35 per cent of the world's ocean tonnage was carried in British ships and 60 per cent in ships of European register, it is hardly surprising that it is in Europe that we find the cargo crane most highly developed.

Luffing Cranes

One of the chief disadvantages which the ordinary luffing crane works under is that when the jib is luffed in the load suspended from the jib head is simultaneously raised; conversely, as the jib is let out the load falls by a corresponding amount. This is all wasted work and means an unnecessarily large motor to work the luffing gear. A further result is that the jib is luffed in or out as little as possible and the flexibility of the crane is seriously impaired.

To overcome this objection a number of different designs of a type of crane known as the "level luffing" crane have been developed. In all cranes of this type a compensating gear in some form or another is provided whereby the load is made to travel along a horizontal path irrespective of the rise and fall of the hoisting pulley caused by the luffing in or out of the jib. A well-known make of this type is illustrated in Fig. 1.

The distinctive feature of this compensating gear, which provides the level luffing motion, lies in the fact that the crane jib is composed of two sections; the outermost of which is folded in toward the other automatically as the load is luffed in, and vice versa. During the operation of luffing, therefore, as the lower section of the jib is raised at a steeper and steeper angle, the outer end folds down; the relative motions being such that the sheave at the extreme end of the jib travels along a horizontal path, the suspended load doing likewise.

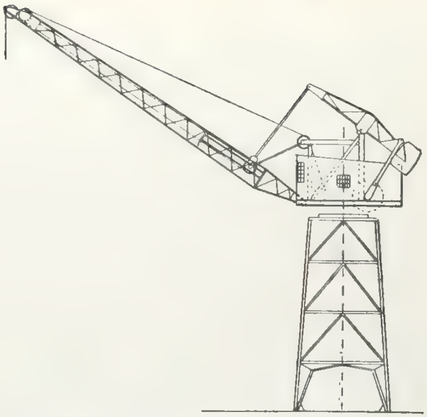


Fig. 6 Stationary Type of Crane in Which Luffing Is Accomplished by Means of Rocking Lever

As the load being lifted is neither raised nor lowered during luffing operations, it will readily be seen that the power required is only that which is necessary to overcome the inertia of the parts moved.

The balancing of the dead weight of the jib also has a bearing on the ease or otherwise with which luffing can be carried out. In the type of crane shown in Fig. 1, the counterweight D moves simultaneously in the opposite direction to the jib, so that the two are always very nearly in balance.

The value of this balanced level-luffing system will be appreciated from the fact that on two cranes of similar capacity and radius, that fitted with this gear will have a luffing motor of about one-tenth the power of the other, and when it is considered that in most cases the jib is luffed with every lift, it will be realized that an enormous saving in power is effected.

Discussion of Operation

The crane shown in Fig. 1 has a maximum outreach, measured from the face of the dock, of 56 feet 9 inches, which is equivalent to a radius, measured from the crane

Continued on page 30 Advertising Section

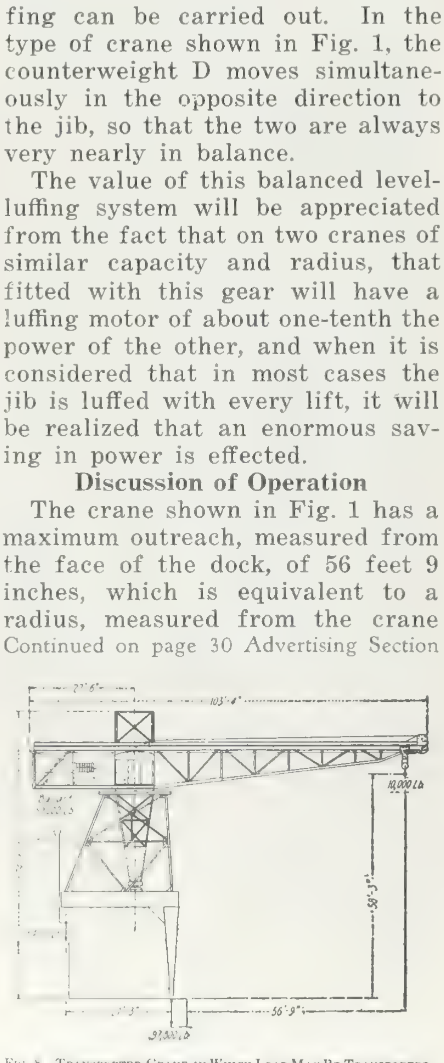


Fig 8 Transporter Crane in Which Load May Be Transported to Rear of Machinery House, a Feature Not Incorporated in the Crane of Fig 7

In the Engine Room

A Department Devoted to Marine Engineering from the Standpoint of the Operating Platform

At the Chief's Desk

By C. E. Milbury

Spare Parts

Spare parts are often needed in a hurry, and much valuable time is lost when it is discovered that there are several layers of paint covering machined surfaces.

There is no occasion for this, as spares can and should be kept in the pink of condition.

In my survey of a ship's engine room, the spares receive my most careful scrutiny, for it is upon the condition of these that I judge those in charge, far more than by pretty paint work and shining handrails.

If I find valuable gear such as crank pin, or cross head bolts, piston rings, or spare bearings in a state of oxidation, then my opinion of the engineers in charge is promptly formed.

It is mighty pleasing to look over an array of spares that are well kept and can be made ready for immediate service merely by wiping off their protective coating with a little kerosene.

Spare parts should be overhauled at least quarterly. They should be brightened up, nuts run down on threads and made to work freely.

Paint should be kept away from them, and only a soluble protective coating employed in redressing them. They should never be wrapped in canvas or in any way concealed from view, for such procedure is bound to promote neglect.

Treat your spare parts as you would your personal tool kit, they are valuable adjuncts and they cry out the degree of your own efficiency.

Bang, Bang!!

Does it pay to run an engine with a slack cross-head or crank pin bearing? The pounding is mighty annoying, but the mere thought of having to shut down for perhaps an hour to install the spares is more than annoying.

I once sailed with a chief who rather than have it appear in his log that he had stopped his engine to install spares, permitted a crank pin to literally pound the life out of itself for three weeks, before he was convinced that something drastic had to be done about it.

In this case the pounding of course obliterated the oilways and it was the water service alone that made its running at all possible.

Just take a pencil sometime and figure what the pounding means in tons of punishment at the top and bottom of the stroke, under shock of full receiver pressure, of course. Multiply this by the number of hours that the pounding has ensued, then reason whether or not the total tonnage of punishment has any effect upon the molecular composition of the pin.

Sometimes pins crystallize, and some engineers wonder why.

Heap Big Chief

If you are a Chief, study your assistants and learn to trust them. Then if you find them worthy, don't butt into their work, for if they are honest (and you won't let them ride if they're not) they will let you know when they are in trouble and need your counsel.

Never be so egotistical as to think that you are the only engineer on the ship and a self ordained instructor in a floating school of marine engineering.

If assistants of proved record won't sail with you for more than a trip, take a day off and survey yourself, because the office will be bound sooner or later to seek the whys and wherefores.

There might be something in the administration of your duties that to them is off form, for by virtue of being chief is not conclusive proof that your judgment is beyond question. Strange as it may seem, your assistants can often out-distance you in experience and knowledge.

The continual quitting of good assistants gives the engine department acute indigestion, whereas assistants who remain are builders. If they are worthy, do your darndest to keep them. Instill interest and confidence in them. If they are not worthy "can" them quick. In either case both the ship and yourself will profit.

It is your own business whom you cultivate as your friends, but be cautious, for you might unknowingly cultivate the friendship of a tale bearer, and this will certainly make trouble for you.

Long, inflated reports to the marine superintendent, containing several dozen assorted I's and me's, make very tiresome reading. He would much rather have a brief and concise report written to the point. Modesty is its own reward.

Last, but not least, don't worry! The first assistant will never get your job away from you so long as you conduct yourself as a chief should. If you ponder on this point unduly, you actually admit your inferiority.

Shaft Stresses in Racing

In racing, I believe that a propellor shaft undergoes the severest punishment of its existence, for under full normal load the shaft is naturally wound up and the torsional stress over its length has become fixed.

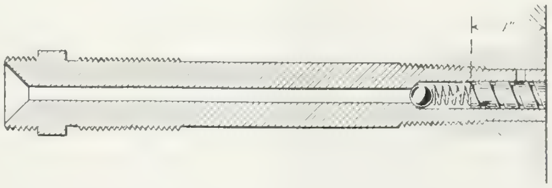
With a propellor shaft therefore suddenly leaving the dense water for the less dense, the load condition on that shaft suddenly changes, and the shaft in consequence partially or wholly unwinds, only to be suddenly rewound as the propellor again plunges into the denser water.

The torsional stresses are therefore not uniform, but are suddenly and constantly changing, and may be likened to the twisting and untwisting of a steel rod. Molecular disintegration slowly but surely progresses.

This form of punishment, I believe, is even greater than that exerted by the operation of a shaft at critical speed, wherein the power agent tends to wind the shaft to uniform torsion, the partially wound shaft in turn having a tendency to return to its inert form.

In this degree of critical suspension (which of course is unusual) the shaft is subjected to a continual rocking stress. Yet I do not believe that this punishment is nearly so violent as the seldom thought of strains of racing.

Lubricating Power Cylinders of Diesel Engines



A suggested improvement in lubricating oil injection tube for diesel engines.

At the Kansas City meeting of The American Society of Mechanical Engineers, W. O. Northcutt of the Sinclair Pipeline Company, Tulsa, Oklahoma, presented a very interesting report of tests conducted to show the ill effects of oxidation on lubricants in diesel cylinders. As supplementary to the article by C. G. A. Rosen on "Diesel Cylinder Wear," published in the October issue of Pacific Marine Review, we present here an abstract of the report by Mr. Northcutt:

Expectation in Liner Wear

With normal conditions, properly designed cylinder liners, and piston rings made of the proper material, and using a partially perfected method of applying lubricating oil to the pistons, it is possible to operate 750 to 1000 hours per 0.001 inch of cylinder liner wear. With these same conditions and a proper method of applying the oil to the pistons, one may expect to obtain from 1800 to 2000 hours per 0.001 inch of cylinder liner wear at the maximum cylinder diameter. The arrangement of the lubricating oil piping, the lubricating oil injection tube in cylinders, the size of lubricating oil ports in the cylinder liner, and the design of the mechanical lubricator and the lubricating oil injection tube are the necessary details to be considered in the control of oxidation of the oil.

Lubrication Details

Some of the details of cylinder lubrication which assist in the oxidation of the oil are large oil ports in the cylinder lines, air pockets in the lubricating oil injection tubes, air pockets in the lubricating lines between the mechanical lubricator and cylinder check valves, and oil grooves arranged in piston skirts of the pistons or around the inner circumference of the cylinder liner. Take for an illustration a certain lubricating oil injection tube containing a check valve located near the end of a tube which is secured in the cylinder liner. From the end of the injection tube leading into the interior of the cylinder liner there is a large oil port 11/16 inch in diameter, forming a pocket approximately ⅝ inch deep. The oil port is located between the fifth and sizth piston rings when the piston is on bottom center. At this time the oil should enter the cylinder past the check valve; but this is not the case and it would appear that on the downward stroke of piston the gas pressure behind the bottom or lower piston ring whips out on to the piston skirt the oil that might have passed the check valve or accumulated in the oil port. The piston is not water cooled and the oil accumulates in a series of oil grooves around it, so that the oil is gradually decomposed by heat into an asphaltic matter, and later is transferred to the cylinder walls with its lubricating properties destroyed. Under the above conditions the base from which the oil is refined may play an important part. The hydro-carbon molecules of the paraffin crudes belong to the family known as the open chain, the carbon atoms being fully engaged and tetravalent, and each carbon atom is attached to four other atoms. The hydro-carbon molecules of lubricating oil refined from the asphalt crudes are capable of absorbing hydrogen, oxygen, or sulphur, which may be the constituents of the gases behind the piston rings. If the lubricating systems were so arranged as to have new, clean oil at the inner portion of the cylinder liner for the piston rings to wipe over and spread into a film on the liner walls, then the base of the crude from which the lubricating oil is refined would not be the controlling factor. The viscosity of the oil would be the controlling factor.

Special Injection Tube

A special lubricating oil injection tube, shown in the illustration, has been designed and has been used for over a year. The function of the tube is to deliver the oil in an unoxidized condition at the inner portion of the cylinder liner at a point between the first and second rings from the top of the piston when the piston is on bottom center, which assists the piston rings to spread the oil in a film on the walls of the cylinder liner. The injection tube contains a small ball check valve, and has a small plug pressed into it at the cylinder end. This plug has a small spiral groove cut around it. One end of the plug terminates at the inner portion of the cylinder liner, and the function of the spiral groove is to prevent the oil from being whipped out on to the piston skirt as the rings pass over the port. This keeps the oil at the proper place at the inner portion of the cylinder liner, from which the piston rings pick it up and spread it over the walls of the cylinders in a clean, unoxidized form.

More attention should be paid to the condition of the oil film than to the quantity. The pulling of pistons and the finding of the cylinder walls well covered with an oil film is often misleading, because the oil may contain oxidized products that are detrimental to lubrication.

Tests of four different lubricating oils taken after 48 hours' run, after two weeks' run, and after four weeks' run with a commercial lubricating oil system show conclusively an increasing degree of oxidation.

These detrimental conditions of lubrication can be overcome by proper attention to the design of the lubrication system. Pistons of two-cycle engines can be successfully lubricated above the exhaust ports by using a properly designed lubricating oil injection tube, a properly designed lubricator which pumps oil only, and individual pumping units that can be timed separately in relation to the piston.

Insulation Measurements By Voltmeter

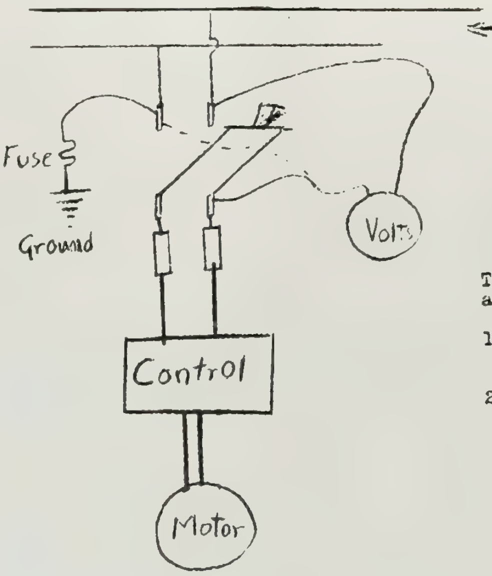
By J. M. Dodds,
General Electric Co., San Francisco

THERE is nothing new, original, nor complicated about the voltmeter method of measuring the resistance of insulations. This method is only suitable where a source of direct current voltage of over 100 volts is available as well as a direct current voltmeter. The reliable limits of this method are between 10,000 ohms as a minimum and 2,000,000 as a maximum, but this covers very nicely the values ordinarily encountered in the insulation resistance aboard ship. The attached sheet, with its directions, shows the use of the method together with an example worked out. Better results are obtained by the use of a high reading voltmeter; i.e., if a 150/750 volt voltmeter is available use the 750 volt scale for insulation resistance measurement.

In measuring the insulation resistance of the motor and control circuits as indicated, it is necessary to place the controller in the running position so as to be sure there is a good metallic contact for all of the circuits in the motor and controller. If the resistance measured is found to be sub-normal, it is then desirable to divide up the circuit between the motor, the controller, and, finally, the wiring in order to locate the fault. This should be done by first disconnecting the motor entirely and taking another reading and if the resistance is still low, disconnect the controller. If the resistance on this reading shows satisfactory, it is safe to conclude that the fault is in the control. If it reads too low again, however, then it is safe to conclude that the trouble is in the circuit between the control and the switchboard. The resistance of the insulation of all of the circuits on the switchboard and throughout the entire ship can be taken at one reading if a separate source of 125 volts direct current is available. Also, the insulation resistance of one generator shut down can be measured by using the voltage from the other generator.

An insulation resistance as low as 25,000 ohms does not necessarily mean that there is a fault in the insulation, but usually means that there is dirt or corrosion around some of the outlets of the metallic circuits, such as carbon dust around the brush holder studs or copper dust around the insulating strips in a drum controller, as well as moisture condensing in parts of conduit boxes or other outlets. It is advisable to attempt to eliminate a condition which shows a resistance of the insulation as low as 25,000 ohms as the condition itself is not necessarily serious but may tend to get worse and might result in a blow-out, or burn-out. Insulation resistance of new machines may run as high as 50,000,000 ohms, but ordinarily they will be found to be probably in the order of 1,000,000 ohms and if badly in need of cleaning, may drop down to 50,000 ohms.

These figures are given merely to assist in judging the results of tests and must be used with considerably good judgment in arriving at important conclusions.



125 V. Bus DC

1 ground one side of bus through fuse

2 Connect one side of voltmeter to other side of bus and other side of voltmeter to either side of motor circuit

Take two readings one right after the other

1 - Read line volts = E (See dotted line)

2 - Read volts with meter connected in series with the insulation = V

Let X = unknown resistance of insulation in ohms

A = Resistance of voltmeter in ohms (Usually marked on instrument face)

$$\text{Then } X = \frac{A \times (E - V)}{V}$$

Example - Reading No. 1 is E = 126 volts
Reading No. 2 is V = 12 volts
Res. of voltmeter is A = 60987 ohms

$$\text{Then } X = \frac{60987 \times (126-12)}{12} = \frac{60987 \times 114}{12} = 579.376 \text{ ohms}$$

Diagrammatic sketch showing method of making connection and formula for measuring insulation by voltmeter.

Dope on Scotch Boilers

WE often wonder if some engineers afloat appreciate what they have in their boiler rooms.

There has recently been issued by the American Marine Standards Committee of the Department of Commerce a booklet entitled, "General Instructions for Operation, Cars, and Upkeep of Scotch Type Marine Boilers." The preface of this remarkable booklet says that it makes "no pretension that the instructions are either complete or perfect." These "incomplete" instructions cover fifteen closely printed pages and are certainly calculated to impress any engineer with the importance and responsibility of his position afloat.

Copies of the publication can be procured from the Superintendent of Documents at the Government Printing Office, Washington, D.C., for 10 cents per copy. We would strongly advise that junior engineering officers, particularly, procure a copy of this document in preparation for taking examinations before the Steamboat Inspection Service.

EVER IN A TIGHT CORNER?

Marine engineers at sea are often called upon to use strenuous emergency measures for getting the ship out of trouble. Exchange of experience along such lines is of great value to the marine engineering profession.

In order to stimulate such exchange, Pacific Marine Review is offering cash prizes for the best 500-word stories relating such experiences. On this page we offer two samples.

For all stories of this character published we will pay $5. For those judged the best in every three months' period we are offering two prizes of $15 and $10.

The committee of judges will be announced in the December issue.

A Boiler Room Fire

THE steamer was a freighter whose master was an old-time sailing man, a good scout, but unfamiliar with the operation of steam. Docking the vessel at an Oriental port, the writer, who was chief engineer, was in the engine room. Bells were coming down rather fast, as the "old man" depended greatly on the engines and worked them plenty. The fireman had been ashore the night before and had a bad "hold-over." We had just answered a slow astern signal, when a terrible yell came from the fire room, and at the same moment a gush of smoke drifted through to the engine room. I left the first assistant at the throttle and, making a dive for the fire room, found it full of smoke with a flicker of flames all over one of the boiler fronts. Running back to the engine room I blew the signal tube whistle to the bridge. The captain answered, and I told him we would have to stop the engines. "If you do," said he, "We'll go ashore." "If I don't," said I, "We'll blow up."

I told the first assistant to stop her and to help me in the fire room. The oiler was on his rounds down the shaft alley. The "first" and I wrapped our heads in our jackets and ran into the fire room. The fire was now burning strong, and probably a lot of smoke was coming up through the forward gratings, for we heard the fire alarm bell going.

Having an idea what the trouble was, the first and I crawled toward the blazing boiler front and succeeded in shutting off the oil supply line to the burners. (All this happened in less time than it takes to write it.) With the fuel supply closed the fire soon went out, assisted by a few buckets of sand which the "first" and I threw as soon as we could stand up.

Regular fires were burning under the other two boilers, and leaving the "first" in the fire room I rushed back to the engines, ringing up the bridge that all was O.K. below. Bells again began to come down, and the vessel was soon fast to dock.

"Finished with engines" having been given, I commenced to look about to see what had really happened.

I soon discovered that the drunken fireman had taken out a burner with the fuel oil valve wide open. Of course this started the blaze.

Having started the first assistant and oiler to work to get matters straightened up, I went to see the captain. The deck folk had hose ready by this time but no pumps had been started, which was lucky, as water is the worst thing in such cases. Found the old man a bit excited, which was but natural for one of his age, but full of praise for what had been done by the engine room force.

A Fouled Wheel

THE readers of your new department—In The Engine Room—may be interested in an experience I once had as first assistant engineer of an East Coast steamer plying between New York and Mexican Gulf ports. We entered one of these latter on a Sunday morning, and when working into the somewhat flimsy wharf a line fouled the propeller. No signals from deck came down, and the first the engine room force knew of the matter was a slowing up and stopping of engines, which were under slow bell at the time. Then wild cries down the engine room hatch, with a stop signal from the bridge, told the story. Going on deck we found that a new six-inch manila line had done the trick. It was impossible to move the engines and in fact unwise to attempt it. By aid of a shore side boat other lines were gotten to the wharf and the vessel was moored. On survey of conditions aft we found the sea very clear and the big ball of rope with its fag ends plainly visible, though twenty feet under water. No pole with chisel lashed on would aid in that job. It being Sunday and the port of little consequence, no diver was available. So I, being young and husky and built on slim clipper lines, volunteered to make a try at clearing the mess. Armed with a keen hatchet from the carpenter's kit, I made a crack, and was able the first time to sever a few of the strands before coming up for air. The first mate, short and fat, built like a Dutch lugger, was enthused with the idea and volunteered to assist in the diving operations, "spelling" me. His efforts were laughable though praiseworthy. He could not get his stern under water at all, in spite of frantic efforts to do so. But I, spurred on by the plaudits of the rest of the officers, together with the good intentions of the first mate, after a few dives had enough cut away to partly clear the hub of the wheel. Then I made a line fast to some of the ends. This taken to a deck winch with the engines turned by the gear, cleared a part, and we soon had things so the main engines could be run.

I am now the superintendent engineer of a big steamship company with headquarters at San Francisco, and it is a safe bet that I could not now repeat this stunt, as I have begun to enter the class of the bulky first mate and have too much surplus bouyancy both forw'd and aft.

Pacific Workboats and Their Power Plants

Puget Sound Workboats

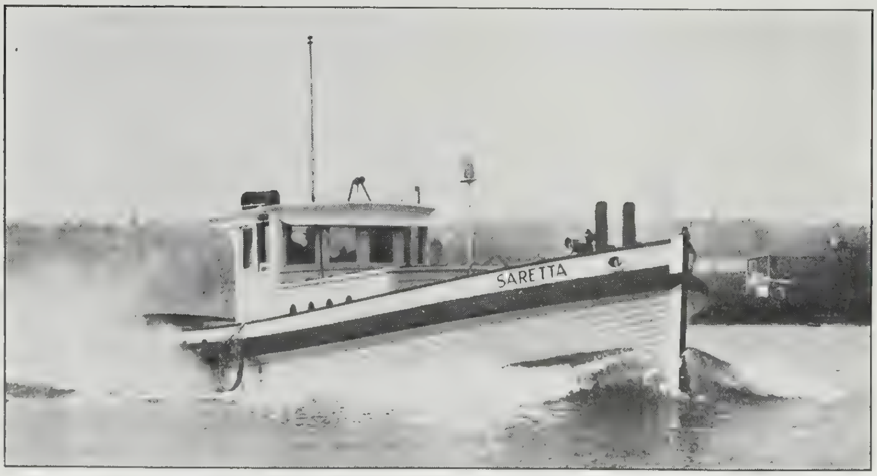
Seattle Boatyards

The McAteer Shipbuilding Co., Inc., has a very well located and large yard at the mouth of the Duwamish River, Seattle. This yard has built many craft for deep sea and local trade. At present they are making more effort towards repairs than new work, though they have in the sheds a 38 foot by 10 foot by 4 foot 8 inches troller which will soon be ready for work.

The power plant is not yet decided on. Besides this job the ways, of 800 tons capacity, have been kept busy the past season. Complete carpenter, blacksmith, and machine shop facilities insure quick repairs. G. H. McAteer, son of the president, John McAteer, is general manager of the plant.

The Maritime Boat and Engine Works, with plant at 1710 West Spokane street, Seattle, is devoted mainly to the building and repairs of seiners and other classes of fishing vessels. The president is L. T. Sandvik; vice-president, J. Tjerandsen; secretary and general manager, F. Lepsoe. These gentlemen are all of old Viking stock of families that have been shipbuilders and metal workers for generations. The yard has a reputation for doing excellent work and is very well fitted for it. Three ways, with capacities up to 100 feet; a complete carpenter and machine shop, with a large smithy, are operated. There are three separate slips for barge and scow construction, this being quite an industry in Northwestern waters. The manager reports a very busy season last spring in repair work. They were the builders of the sturdy workboat Haakon. In the busy season a force of around a hundred men is employed, and quick repairs and construction jobs are the rule.

Captain P. T. O'Connor of the Seattle Fire Department, who very kindly acted as guide to the workboat editor of Pacific Marine Review during a recent visit to Seattle's waterfront.



The Saretta, towboat built by the Ballard Marine Railway Company of Seattle for Hawaiian Islands interests; powered with Fairbanks-Morse 140-horsepower full diesel engine.

The Ballard Marine Railway Co., Inc., has just completed a fine cruiser for Mr. Michelson of Seattle powered by a 40-horsepower Fairbanks-Morse full diesel engine. This yard also built the Saretta, designed by Coolidge & Hanson of Seattle, for Hawaiian owners, and many well known craft which have proved very speedy and successful. Of especial note was the cannery tender, Mary Lou, built for George T. Meyers. This workboat, with her 135-horsepower Atlas-Imperial full diesel engine, made 10 knots on her trial trip, but her sea performance was more remarkable, covering the distance between Seattle and Ketchikan in 72 hours, which is passenger time. T. W. Smith, manager of the shipyard, reports very good business in repair work the past spring, and is making preparations for a big run of business when the fishing season closes Several prospects for new vessels are looming.

The Moburg Shipyard, on the shores of Lake Union, foot of 20th street, has turned out several halibut and seiner craft during the past year. There are now two on the ways, one 59 feet by 15 feet and the other of 62 feet by 16 feet. The former, to the order of Captain Chris Erlendsen, will have a 75-horsepower Atlas-Imperial full diesel engine for power. The latter, for Captain O. Melver, will be fitted with a 90-horsepower Bolinder. These when complete will make seven similar craft for the past season. Ole Moburg, proprietor of the yard, does not go in for repair work, confining himself to building, and at this he is a master hand. He has recently secured the contract to build a new halibut schooner for Hanney & Nelson.

S. E. Sagstad operates a yard for new work only at the foot of 20th street, N. W., right on the Lake Union waterfront. This yard, though small, has turned out eight workboats during the past year. One just completed for Captain John Oleson is a 40 foot troller which will be propelled by a

Standard gas engine of 40 horsepower. She is an able and sturdy looking craft. Several of those built at the yard during the past season were larger, one being 68 feet in length powered by a Fairbanks-Morse 120-horsepower CO engine.

Feenaughty Machinery Co., 1028 Sixth avenue, So., Seattle, are the distributors for the new Hill diesel products. This latest prime mover to enter the marine field is claimed by its manufacturers to be of the highest efficiency and simplicity. Low in fuel costs, easily started from cold, the builders and agents believe they handle a motor which will be favorably received by the marine operators of small craft. Powers from 6 to 125 horsepower are built.

N. J. Blanchard Boat Co., whose yard is on the south shore of Lake Union, Seattle, is one of the best known in that vicinity. It was here that the famous yacht Malibu was built, besides several other well known vessels, among them being many tugs and workboats, all strong, sturdy, and well designed. One of their latest craft is the Wm. Burnett, built for the Merrill & Ring Lumber Co., for use in the logging industry towing rafts, booms, and scows. She is not large, being 52 feet in length, and is powered with two Viking semi-diesel engines of 48-horsepower each. Since entering service a few months ago she has done splendid work and her owners speak highly of both the hull and engines. Besides this vessel, the yard has turned out four of their standard cruisers, two fitted with 35-horsepower Kermath gas engines, and two with Continental Van Blerk's. In addition to the new jobs, there has been a good run of repair work during the past season and prospects are good for several new vessels.

Lake Union Drydock and Machine Works at 1515 Fairview avenue, No., Seattle, report that business has been very good for the past season on repair work. In addition to work done on tugs, cannery tenders, etc., they have had United States lightship repairs, also coast guard and survey vessels at the yards. They lately made repairs to the steamer Santa Ana, which was damaged by striking a rock in northern waters. In new work they have built several pleasure cruisers and specialize on a standard forty-footer called "The Dream Boat." This type of craft is well liked by those of moderate means and, with Continental-Van Blerk 40-90 horsepower engines, is speedy and economical. Six of these have been built recently. A cannery tender, the Sacco, which has turned out a success was also a product of the yard. The firm operates a 3500-ton dry dock, one of 500 tons, and three others of 100 tons each. These have all been kept fairly full with entries for cleaning, painting, and repair work.

Cannery tender Mary Lou, built by Ballard Marine Railway Company, Seattle; engined with Atlas-Imperial 135-horsepower diesel engine.

Lake Washington Shipyards is located on the north side of Lake Washington, about 28 miles from tidewater. This yard is reached by railway, a splendid highway, or by clear fresh water where the minimum depth is 20 feet. This makes an ideal location for building wooden vessels, though the yard is well equipped to handle steel work as well. Plate punches and shears, bending floors, and furnaces are unusual things to find so far from the conventional waterfront. But the writer, an old hand at the game, was struck with the plant's completeness. A thousand tons ways, with a depth over the cradle sills when submerged of 16 feet, together with a smaller ways suitable for a 250-ton lift, with cranes, carpenter shops, sawmill, a well equipped machine and blacksmith shop, give facilities to handle almost any class of work. The usual complement of air compressors, electric and gas welding plants make a plant capable of handling any job.

Among the notable jobs done at the Lake Washington Shipyards were the changing into ferry boats the City of Bellingham and the Chippewa. These vessels were completely rebuilt from ocean going steamers into ferryboats, the first in six weeks. and the latter in 100 working days. The work was considerable, as practically all the

Scene at the Lake Washington Shipyards, Seattle, starting work on the conversion of a Puget Sound steamer to the ferryboat Chippewa.

Ferryboat Chippewa as finished by the Lake Washington Shipyards

upper structure of the two vessels had to be rebuilt. Another notable achievement was the building of the diesel driven ferryboat Kitsap. This was done in nine weeks, from keel to trial trip. It will be remembered that the Kitsap was the first vessel to have 600-horsepower Washington-Estep diesels installed. These engines were also ordered at the same time the work on the hull was arranged for, and the race to finish was a dead heat between the yard and the shop and reflects credit on the men of both establishments.

The executive head of the plant is Charles E. Taylor, a native of Oregon. He learned his profession in Seattle, and is a shipbuilder of parts. C. A. Burckhart is president of the company, and P. E. Voinot, manager. In 1923 these three men took over the yard and in spite of slack times and dull seasons have kept a force of men employed on repair and new work. The yard in the pre-war time was operated by Captain J. L. Anderson, and four large wooden steamers were built there for the French and Norwegian interests. Previous to that many tugs and schooners had been turned out.

The fleet of the American Pacific Whaling Co. has most of its overhauling done at the Lake Washington Shipyards, and many private owners and operators send their vessels for repairs and winter hauling out to this yard.

Coolidge & Hanson, naval architects and brokers, of Seattle, report very good business for the past season. They have supplied designs for several new vessels during this time and arranged sales and transfers of others. Perhaps the most notable job they have recently done is the new United States Bureau of Fisheries cruiser Crane. This vessel, which will be 90 feet length by 20 feet beam and 13 feet 5 inches moulded depth, will be powered by a Washington-Estep direct reversible diesel engine of 200-horsepower. Particular attention has been paid to the layout of this craft, which will be one of the best of Uncle Sam's fleet in her class.

Atlas-Imperial diesel engines have been moving actively in the Northwest, according to the report of Captain O. E. Nilsen, agent at Seattle for the Atlas-Imperial Engine Co. Several installations in new vessels have been made, some 35 having been placed in seiner boats. The Elisha P. Ferry, a cruiser patrol boat for the State Fisheries Commission, a rebuilt 65-foot seiner, has had her old 80-horsepower gas engine taken out and replaced by one of the new type, 75-horsepwer Atlas-Imperial diesels, improving her speed and effecting great economy in operation. The Anne W., a heavy steam tug, has also had her old steam engines removed and a 275-horsepower, 6-cylinder, fully reversible Atlas-Imperial unit installed. The operators claim she can do much more work with the new plant than the old one at about one-fifth the cost.

The Isaacson Iron Works of Seattle are manufacturers of anchors for workboats and are doing a big business in general and drop forgings for the same class of craft. This company also is a heavy producer of steel structural shapes, plate work for truck bodies, steam shovel grabs, and buckets. Crankshaft forgings up to the largest sizes are turned out, either rough or finished to limit gauges. To handle all this work the firm operates a big factory on the waterfront, handy to rail and water. The main building has six heavy steam hammers and three hydraulic presses, together with the necessary furnaces for heating. Overhead and side cranes facilitate easy handling of great weights, and the arrangements are fine for rapid production. A physical testing laboratory and a large galvanizing plant form part of the plant. For finish machining the company is associated with the Young Iron Works, and is thus in a position to turn out a highly finished product. The anchors made by Isaacson Iron Works have a reputation for rugged strength and are called for in the East and South, several carloads having been shipped to New Orleans and New York the past summer.

King Shipbuilding Co., East Marginal Way, Seattle, has had a very good run of work in the repair line the past season. The two ways, one of 500 tons and the other 200 tons capacity, have kept busy an average force of 45 men. This firm specializes in repair work, doing little new work except on small boats. Complete machine, blacksmith, and carpenter shops are operated, all classes of work being taken on and finished in quick time.

Fishing Vessel Owners' Marine Ways, Inc., on the north shore of Lake Union, Seattle, reports a very busy season the past year on general repairs, the several ways and shops of the firm running full time on the business of repairs to the big fleet of work and fishing boats looked after by the yards. During the past few months the general offices of the corporation have been located in very commodious quarters in the second story of a new building which overlooks the ways and yards. A derrick to handle any weight a workboat might need has also been installed, and the whole yard is surrounded by a strong fence. Some new machines have been added to the shops, and preparations are being made for a big run of work next season.

Puget Sound Engineering Co., Inc., is occupying the yard and shops of the Babcock Shipbuilding Co., Fisherman's Dock, Lake Union, Seattle. This firm, besides a general machine business, is specializing in diesel engine installations, handling all of the Atlas-Imperial work at Seattle. D. E. Bigelow, general manager, reports business good, with prospects better. The shops are equipped with metal working machinery for any class of new or repair jobs. A heavy crane to handle 20 tons is an advantage, as is the fact that the shops and sheds are located on deep water frontage.

Westlake Engineering Works, 1722 N. Westlake, Seattle, is a close corporation operated by an old time marine engineer, J. C. Buchanan. Specializing in marine repairs, which under the supervision of "Jamie," are done exceptionally well, a good volume of business results. A shop well kept and fully equipped, with fresh water wharfage, makes repairs easily and quickly accomplished. Mr. Buchanan is from Scotland, and an old-time friend of the late Robert Forsyth and George W. Dickie, and many others of the "old guard," he having been foreman at the Union Iron Works of San Francisco many years ago. During the late war he established a time record in the installation of machinery in steamers, having in one instance delivered a four thousand ton vessel under steam six days after her launching. During this time the main engines and boilers were installed, together with many of the auxiliaries.

Richard Frobose Co., distributors of Bolinder oil engines, Seattle, report many inquiries for workboat engines, and satisfactory sales. To better demonstrate the Bolinder machine as a marine power plant a 32-foot cruiser is being built by **Olson & Sunde Machine Works,** 4125 Burns avenue, Seattle. This craft will have a 25-30 horsepower Bolinder oil engine installed and will make easily 10 knots at 900 revolutions per minute, the designed engine speed. The firm, finding its quarters at 83 Marion street too small for the growing business, has arranged to increase it trebly by leasing two stores adjoining. This will give more room for display of engines, and storage of spares.

Washington - Estep diesels are very much in evidence in the Northwest. The **Washington Iron Works** has just closed an order from the United States Coast Guard service for five Washington-Estep diesels, 4-cylinder, 8 by 10 inches, to develop 110-horsepower at 600 revolutions per minute. These units are to be used as motors for lighting and auxiliary power on five new vessels to be built in the East for the Coast Guard. They are to be connected in tandem to a 50-kilowatt direct current generator and a 30-kilowatt alternating current generator. Close governing and economy of fuel are among the severe demands of the purchasers.

A Washington-Estep diesel of 180 horsepower, 4-cylinders, 11½ by 16 inches, designed for 280 revolutions per minute, is to be installed in the halibut schooner Chelsea, owned by Ehler Bros. and Armstrong. This engine is to replace a 100-horsepower engine of the same manufacture. The owners desire more speed and are so satisfied with the Washington-Estep diesel that they placed the renewal order for them. A duplicate of this engine will be installed in the Marie Joan, a combination seiner-tender for Captain John Gabelich, of San Pedro, California. A special clutch driven winch will be a part of the installation to handle lines for seines. Another engine of the same size will be installed in a 78-footer building by Joe Martinac, Tacoma.

Captain Berger Edwards has also ordered two Washington-Estep diesels of 135 horsepower each for his new 70-foot halibut schooner building at M. Johnson's yard, Tacoma. The new Hanney & Nelson 74-foot schooner building at Moburg's yard, Seattle, will be powered with a Washington-Estep diesel engine.

A 6-cylinder, directly reversible diesel has been ordered for the United States Bureau of Fisheries' new cruiser Crane, building at Port Blakely, by J. C. Johnson. This craft, 90 feet by 20 feet, with a molded depth of 13 feet 5 inches, was designed by Coolidge & Hanson of Seattle and will be one of the latest and best of her type. With her 200-horsepower Washington-Estep diesel engine she will be a speedy and seaworthy craft.

The Marine Electric Shop, Seattle, of which Alex Hanna is proprietor, is prepared to undertake all classes of electric installation on shipboard.

In rebuilding the workboat Anne W. from a steamer to an Atlas-Imperial diesel powered craft, a very clever bit of work was done by this shop in the electrifying of her auxiliary equipment. The steam driven windlass, towing winch, and pumps have been retained as regards the main parts, but the steam cylinders have been repalced by Westinghouse motors. Those on the deck machinery are of 10-kilowatt capacity each, interchangable. Those on the fire, bilge, and service pumps are of 5-kilowatt capacity. A 5-kilowatt generator is driven by the main engine by chain belt, and another of 5-kilowatts by the air compressor engine. These generators discharge into a battery of Iron-Clad Exide batteries, having a capacity of 350 ampere hours. The whole arrangement is somewhat novel as the replacement of the steam engines by electric motors has been of material saving over complete new electric machines.

Garvey & Palmer, west coast distributors of the Foos diesel engine, have established offices and show rooms at 76 Marion street, Seattle. The senior partner of the firm will be in charge until everything is swinging clear. Evidently the Foos is being well received, for even while the office was incomplete, sales have been made, one order being for two units of the 3-cylinder type, 145-horsepower each for Professor Graf's new cruiser, which will be an 86-foot craft. Another set, of 4-cylinders, 200-horsepower, will go in John Scott's yacht, an 88 by 18 by 7-foot vessel. This latter will be built at Blanchard's, on Lake Union. These units are all designed and built for heavy and continuous duty and are guaranteed to stand up under the severest conditions which can arise. Another order has been signed for two sets of Foos diesels, 8-cylinders, 600-horsepower, with De Laval reduction gear. These are for heavy towing service, and particulars of the hulls will appear later in these columns.

CORRECTION

We wish to call attention to an error in the first paragraph of the article entitled "Worthington Engines for Workboats," published on pagt 473 of the October issue. The statement "The Worthington company builds this class of engine in sizes from 50 to 54 shaft horsepower" should have read "from 50 to 540 shaft horsepower."

Tacoma Boatyards

Tacoma, Washington, while not a large shipbuilding center, has a few yards which turn out quite a number of small craft for fishing and workboat duty. The location of Tacoma is in a way ideal for shipyard activities, as electric power is very cheap, fresh water abundant and clear, and deep sea water close to the docks.

At the head of the bay are the big terminals and piers of the transcontinental railways and ocean steamships. These give ready and cheap delivery of materials in the iron and other metal lines, while close to the city are big forests where ship timbers are cut. Labor conditions are reported good, with skilled mechanics available, most of whom own their own homes, usually with an additional patch of arable land which helps to support the workers should business be slack.

Nerenta-K, 82-foot seiner built by Barbare Manufacturing Company, Tacoma. Powered with Atlas-Imperial 150-horsepower diesel engine.

The Barbare Manufacturing Co., East 11th street and Hylebos Waterway, operates one of the largest yards. This company has a complete plant of the latest type to handle work. Besides a well equipped machine shop there is an electrically operated saw mill in connection owned by the company. This enables it to get out its own woodwork, a most desirable advantage in a plant of this kind. The firm also builds many small stock boats fitted with outboard motors. Besides over 40 of these they built last year 12 power boats of 24 feet length, and three seiners, one of 85 feet length and two of 72 feet length. These seiners were all powered with Atlas-Imperial diesel engines. A force of forty men on the average is employed.

Western Boat Building Co., Inc., at 2505 E. Eleventh street, Tacoma, has a busy yard equipped with both wood and metal working machinery adapted to the turning out of craft of all kinds. A ways to handle vessels up to a thousand tons facilitates repairs, a large volume of business along these lines being handled yearly. The company now has under construction a 72-foot seiner for San Pedro, California, interests. This vessel is being exceptionally well built, with heavy floor timbers to carry a 150-horsepower, fully reversible Bessemer diesel engine of the 4-cylinder type.

Martin A. Patrick is manager of the Western Boat Building Co., and has had many years' experience in this work. Last season the yard built nine fishing vessels, from 65 to 72 feet in length. These were powered as follows: Atlas-Imperial engines, 4; Fairbanks-Morse, 2; Washington-Estep, 2. The operators of these vessels report splendid performance of hulls and efficiency of power plants. A fair run of repair work has also been done.

A typical 72-foot Puget Sound seiner, built by Western Boat Building Company, Inc., Tacoma; powered with 150-horsepower Atlas-Imperial diesel engine.

Union Diesel Sales for Yachts and Fish Boats

A NEW 8-cylinder, fully reversible diesel engine of 300 horsepower has just been ordered from the Union Gas Engine Company, of Oakland, California, builders of this well-known type of diesel power unit. This engine is to be installed in a 110-foot yacht now building at the yard of the Campbell Machine Company, San Diego, and will be finished in a special style to make it fit into the surroundings on that type of craft. The engine, however, will retain all of the rugged sturdiness of the standard marine type Union diesel engine which has won so high a name among the sea folk of the Pacific.

On the 20th of October a 55-horsepower Union diesel engine was shipped to Mexico, where it is to be installed in a workboat for the Gulf of California trade.

Rhodes-Jamieson Company of Oakland have ordered a Union diesel of 100 horsepower to be installed in their workboat Daylight. Two other vessels, the Starlight and Valiant, owned by the same firm, have Union diesel engines. Operation of these has been so satisfactory that it was decided to place a new Union diesel in the Daylight.

Santa Barbara. Francis B. Smith, engineer, of San Francisco, is drawing up plans and specifications for a 2000-foot commercial wharf at Santa Barbara to cost $275,000.

Converting Steam Engineers

By Robert H. Stone.

WHILE the conversion of ships from steam to diesel is a common enough occurence at the present time, it remained for the Southern Pacific and Northwestern Pacific Railroads to attempt what was perhaps the first wholesale conversion of steam engineers into diesel engineers. This was in keeping with their policies of seniority promotions and a belief on the part of the engineers themselves that they could make good on the job.

When the engines for the first new ferryboat arrived at the yard of the Bethlehem Shipbuilding Corporation from the New London Ship and Engine Company there were perhaps a scant half dozen of the engineers on the railroad company's pay roll that had diesel licenses. However, the spirit of willingness and cooperation shown by the operating engineers at the meetings held by the King-Knight Company, at their suggestion, to explain the details of construction and operation of the four Nelseco, 4-cycle, mechanical-injection engines in each boat, which they were to operate, was enough assurance that the engines would receive intelligent care. These meetings brought out the fact that a number of these operating engineers had made trips to Mare Island Navy Yard to inspect the Nelseco engines in the submarines there, and that still more of them had taken courses at the Atlas Imperial Engine Company's plant to get sufficient experience to allow them to take the examination required by the United States Steamboat Inspection Service before they could secure their licenses as diesel engineers.

That this interest was not due to curiosity was proved by the continued attention during the time that the first engines were being installed in the ferryboat Fresno, during the tuning up period, and on the trial trips. In this ship, as in the subsequent ones, an engineering force was assigned when the engines were being installed. This force, consisting of a chief engineer, first assistant engineer, and oiler, had every opportunity of observing not only the details of construction of the engine, but, during the tuning up process, of handling the engine under the builder's close and careful observation. While these crews were getting their training, the engine rooms were visited every day by engineers off shift who were expecting to be assigned in the future to one of the other new diesel-electric ferries.

Robert H. Stone, known as 'Bob' to all who have met him for the second time, was born in Leeds, England, and served his seven-year apprenticeship in the "old country" in the shops of Manning Wardel Company, Ltd., at Leeds. Coming to this country shortly after completion of his apprenticeship, Bob worked with engines, making them, erecting them, and curing them when they were suffering from internal disturbances. Fourteen years ago he joined the forces of the New London Ship and Engine Company at Groton, Connecticut, then pioneering in the field of the diesel engine in the United States. For the last five years Bob Stone has been outside guarantee engineer for Nelseco engines, and he has shown the same ability to make friends of the people he meets as he has of the engines he meets, for both of them will get in and work their hardest for him.

Bob Stone is now connected with King-Knight Company, Pacific Coast representatives of New London Ship and Engine Company, as erection and service engineer, and as a promise of becoming a permanent addition to the Pacific Coast he has brought Mrs. Stone and their five children out from the East and settled in the Bay district. Bob has an unlimited diesel license, but with Mrs. Stone and the five little pebbles he won't get much opportunity to make use of it.

The faith shown in their engineers by the executives of these two railroad companies and the faith of the men in themselves has been proved, for the new white diesel-electric ferries of the Southern Pacific and Northwestern Pacific are already familiar figures on San Francisco Bay and to their credit is the fact that they have never missed a scheduled trip. When it became known along the "front" that this experiment of wholesale conversion of engineers was to be tried out there was a lot of headshaking on the part of the old-timers who claimed that it "couldn't be done," but the results have been sufficient answer.

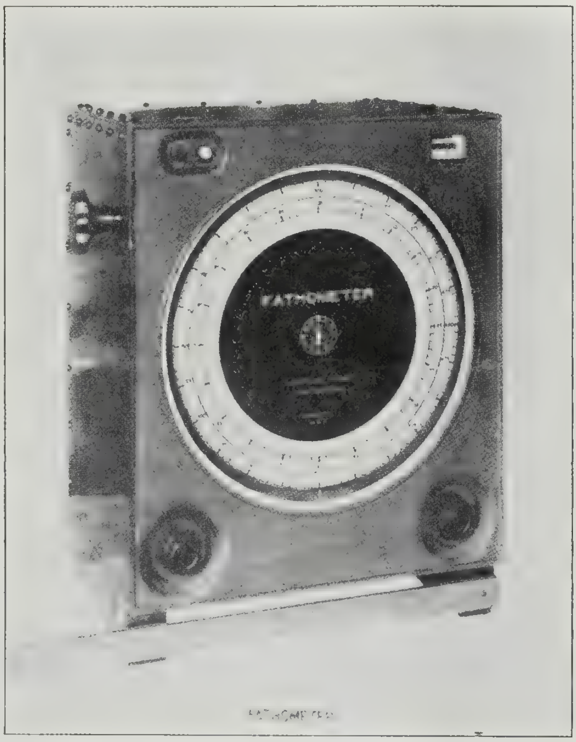
That this program was successfully carried out was due to the engineers and executives of the companies involved, but the three shipyards who ware awarded the contracts for the building of these six new diesel-electric ferries must also receive credit for their cooperation. These yards, namely, the Union Plant of the Bethlehem Shipbuilding Corporation, The Moore Dry Dock Company, and the General Engineering and Drydock Company were unfailing in their courtesy to the builders of the engines and to the engineers of the railroad companies whom they were endeavoring to help in their worthy determination to master the intricacies of diesel engineering so that they would be better qualified to take over their new work. These Pacific Coast yards compare favorably with any of those of the East Coast in the question of equipment and class of work done, and they have the advantage of being able to carry on work out of doors at all seasons of the year. This advantage should mean a lot to these yards in competitive bidding for work, and there is no doubt but that eventually the prejudice of the easterner against the western yards will be lifted and the Pacific Coast will take its place as the leader in shipbuilding.

PORT NOTE

Osaka. The City of Osaka, Japan, has decided upon a four-year program for the improvement of its harbor, involving the reclamation of about 120 acres of tideland, upon which will be constructed a reinforced concrete pier 200 feet long by 33 feet wide.

Auxiliaries—Ship Supplies—Marine Equipment

Modern Sounding Methods



THE Submarine Signal Fathometer produced by the Submarine Signal Corporation, represents a distinct advance in the art of depth sounding. Despite the applications of scientific methods in nearly every sphere of human activities, the lead and line have hitherto remained the unchallenged means of sounding ocean depths, the only change having been the Kelvin Sounding Machine, which utilized the hydro-static pressure for measuring depths. In recent years attempts have been made to measure by creating a sound in the water near the surface, and measuring the time necessary for an echo to come back from the bottom. After years of research and experiment, the Submarine Signal Corporation has produced an echo sounding gear which has proved seaworthy and accurate in tests under various weather conditions.

The principle of operation of the Fathometer is extremely simple. A powerful sound is produced in the water at periodic intervals, traveling in all directions with a velocity of approximately 4800 feet a second. Part of the sound waves which will reach the bottom are reflected upward and return with the same speed. At the surface they are detected by a special receiving device and the time between the emission and the return of the echo is accurately measured. If a second has elapsed, the sound waves will have covered a total distance of 4800 feet and the depth will be 2400 feet, or 400 fathoms, for the sound must travel over the distance twice.

Since the sound waves are produced and detected by electrical means, the device for measuring the time interval can be installed on the bridge so that it is possible for the navigating officer to make his own soundings. The measurements are nearly instantaneous, for it requires only a second to obtain an echo in 400 fathoms, and the sounds can be produced in such rapid succession that the depth is given continuously and the profile of the bottom can be ascertained from the variations of the individual soundings. This latter point is very important when it is desired to know the instant at which a certain depth is reached, as when passing over the Atlantic ledge, for example.

The operation of the Fathometer is entirely automatic and the depth is indicated directly so that no time is lost in making adjustments. In depths less than 100 fathoms, four soundings are made a second as long as the apparatus is left in operative condition, and a glance at the dial at any instant is all that is necessary to know the depth. The operation is no more laborious or difficult than looking at a clock to tell the time. Since there is no material connection with the bottom, soundings are made as simply and accurately when the ship is making full speed as when it is not moving.

The sounding apparatus comprises essentially three distinct parts; a sound producer bolted outside the ship's skin; a sound received in contact with the water; and a Fathometer, which controls the emissions of sound, receives the electrical impulses due to the effect of the echo on the sound receiver and translates the time interval into an indication of the depth.

The Fathometer is started and stopped by a push button, and, once the speed is regulated, the operation is entirely automatic, depth indications being given continuously as long as the device is in operation.

Tests of the Fathometer have been carried out under service conditions in all kinds of weather and in depths from a few fathoms up to 1000 fathoms.

Equipments purchased and installed, or being installed include:

United States survey vessels—Lydonia, Surveyor and Discoverer.

Japanese survey vessel—Manshu Maru.

German survey vessel—Meteor.

Peruvian survey vessels—Submarine R 1 and Submarine R 2.

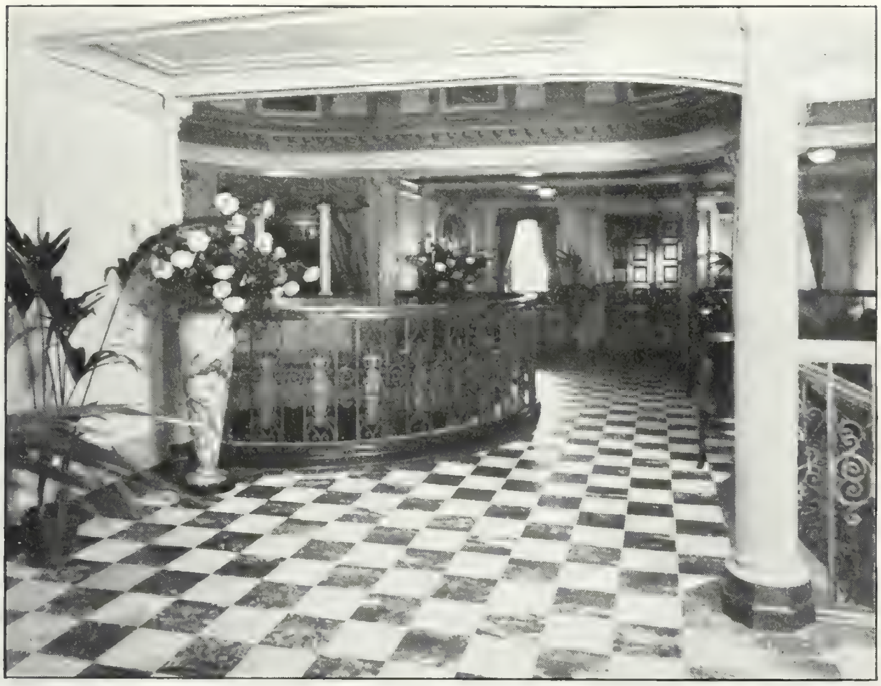
Commercial vessels—Columbus, Mauretania, and Prince Arthur.

Cable Ships—Cyrus Field, Guardian, and John W. Mackay.

United States naval vessels—Seattle and Texas. Also on Italian and Japanese naval vessels whose names are not available.

During a run from Puget Sound to San Francisco, the Seattle gave her Fathometer a test extending over a period of 108 hours. The test was perfectly satisfactory, so much so, that the Fathometer soundings were used in connection with charts to indicate the actual position of the vessel for navigation in fog, checking on radio hearings and on occasional visual hearings with almost mathematical accuracy.

The Submarine Signal Corporation has recently appointed Hibbs, McCauley and Smith of San Francisco as its Pacific Coast Representatives.



The rich mosaic of Goodyear rubber flooring enhances the charm of this beautiful foyer to the music room of the steamship City of Honolulu.

Artistic Deck Coverings

GOODRICH rubber flooring, manufactured by The B. F. Goodrich Rubber Company, is rapidly gaining in favor with the marine trade. The method of combining color combinations gives a much stronger contrast than is obtainable in any printed product.

This flooring is sanitary and is readily applied, being furnished in rolls of standard 36-inch and 48-inch widths. The surface stock is of a very high grade pure rubber. It is not affected by strong soaps and withstands abrasive wear for an indefinite period.

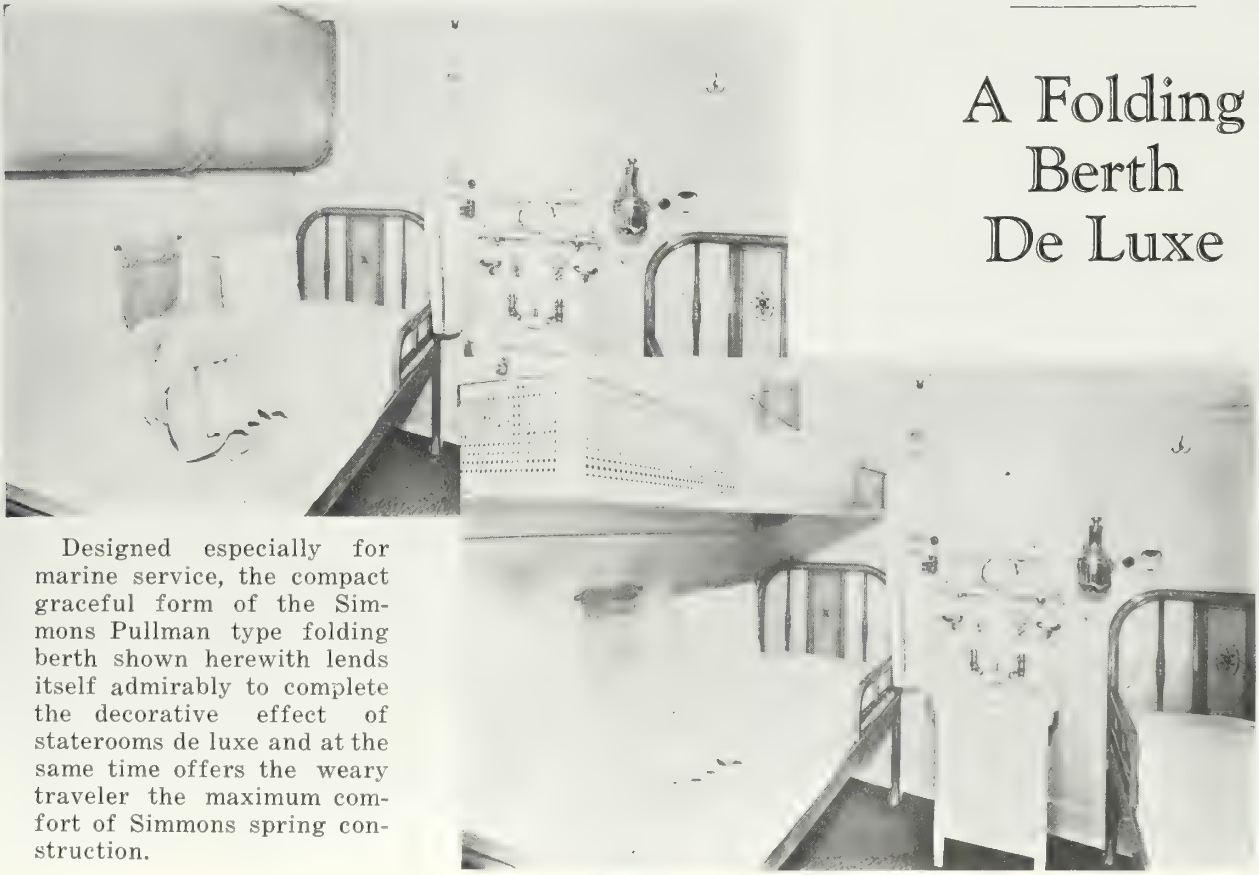
Several large installations of Goodrich rubber flooring have already been made on the Pacific Coast, and Kenyon and Riedy, Inc., who distribute this product, have a number of large projects under way at the present time.

Port Notes

New Westminster. According to reports from British Columbia, Sir Henry Thornton, president of the Canadian National Railways, has announced that plans are being prepared for the construction of a $3,000,000 terminal at New Westminster, financial backing coming from New York and Montreal bankers. The terminal will eventually have a capacity for six large freighters, cold storage plants, warehouses and adjacent industrial sites.

Panama. Information may be obtained from Commercial Attache, P. O. Box 346, Panama City, Panama, concerning the award of a contract for the construction of a sea wall and the filling in of 207 acres at Panama City. The material for the fill will be excavated by a pipeline suction dredge from the Pacific entrance of the canal.

A Folding Berth De Luxe



Designed especially for marine service, the compact graceful form of the Simmons Pullman type folding berth shown herewith lends itself admirably to complete the decorative effect of staterooms de luxe and at the same time offers the weary traveler the maximum comfort of Simmons spring construction.

Lipman Refrigeration

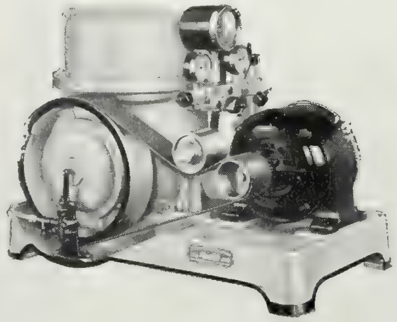
A Note or Two by C. Sowers, Pacific Coast Representative.

THE present day purchaser of refrigeration equipment for the preservation of food aboard ship usually overlooks the desirability of a complete installation, that is, refrigeration for storage boxes, ice making, and drinking water. This work can all be handled with one machine which is automatically controlled.

The Lipman refrigeration machine, manufactured by the General Refrigeration Company of Beloit, Wisconsin, is particularly adapted to this class of work. This small, compact, self-contained, full-automatic machine, which may be had in any capacity, uses ammonia as a refrigerant. Salt water, supplied by a small circulating pump, is used for condensing.

Air cooled condensers have not proved to be 100 per cent satisfactory, as they are usually located in the hot engine room, especially as when cruising through the tropics the demand on refrigerating equipment is most severe, resulting usually in the failure of the air cooled machine to deliver the required amount of refrigeration.

Ammonia is and always has been the standard refrigerant of the world; it is a noninflammable and a nonexplosive chemical, and operates at a positively safe pressure.


The Lipman fully automatic refrigeration machine.

The Lipman compressor is provided with a patented sub-cylinder construction which prevents the oil from being pumped from the crank case. This arrangement makes it possible for the oil level to be higher than the crankshaft, forming an oil seal at the stuffing box, thus preventing the escape of ammonia at this point.

A number of these refrigeration units have been installed in various classes of marine work, and some of them have been operating for a period of years. Installations on pleasure yachts, such as the Invader and Ripple, and the installations on fishing boats, such as Louis II and the Attu, are representative of Lipman equipment.

Northern California representatives for Lipman units are the Price-Teltz Company, San Francisco. In the Pacific Northwest the distributors are the Power Plant Engineering Company of Seattle.

Yale Electric Tractors

A LARGE shipping and delivery Company of San Francisco has been operating Yale tractors on the San Francisco waterfront for nearly four years. At the same time, and for some time previously, it has been operating gasoline driven tractors. A statement of operation costs of the various units gives very conclusive proof that the electric tractor shows considerably less cost of operation than does the gasoline. The fleet of Yale tractors under the San Francisco office at present totals 11 units. Separate account is kept of the total expenses in connection with each unit. The daily cost, including current for recharging batteries, renewals to batteries, tire expense, and the upkeep of motor bearings, chassis, and gears varies from 83 cents to $1.22 per shift of 8 hours as compared with a cost of from $1.38 to $1.95 for gasoline tractors in similar service.

Since the first purchase of a Yale tractor by this company for the San Francisco service in February, 1924, expansion has been served exclusively by this make of tractor. Two Yale tractors were added to the fleet in June of this year, eight were acquired in 1924 and one in 1925.

A Simple and Inexpensive Valve Tester

THE American Hammered Piston Ring Company has just placed on the market an inexpensive and very practical auto engine valve tester.

It comprises a steel collar or socket in which is affixed a strong rubber bulb in the shape of a half ball. The testing operation is very simple, consisting merely of placing the tester over the valve opening, the pressure of a thumb or finger telling the story.

Should the bulb yield to pressure air is escaping, which shows that the valve leaks. If the bulb remains firm under pressure the valve is properly seated.

This ingenious little instrument, which has been named Arico Valve Tester, is made in a range of sizes covering all gas engines in the automobile and power boat field.

Marine Insurance

Edited by JAMES A. QUINBY

Privity Clause Necessary In P. & I. Policies

ONCE in a while we find our courts settling some moot question in definite and decisive terms. The Federal Court, for example, has recently given a most emphatic answer to the difficult problem of whether an assured under a protection and indemnity policy could recover from his underwriters for a loss which occurred through his own privity and neglect, when the policy contained no express provision disclaiming liability in such cases.

It now appears that the assured is allowed to recover under such circumstances.

In Sorenson and Neilson versus Boston Insurance Co., 1926 A. M. C. 241, the District Court in Maryland held that an owner whose manager was privy to a loss could not recover under his P. and I. policy, even though the policy did not contain the privity clause. The manager examined a barge a few minutes before it began to sink. He was aware of certain leaks in her planking and should have sought for others.

Later, in the well-known T. W. Lake case, the District Court of Washington found that owners who knew or must have known of the rotten condition of their vessel were nevertheless entitled to recover under a policy similar to that used in the Sorenson case. With this conflict, the T. W. Lake case was carried to the Circuit Court of Appeals for the Ninth Circuit, which affirmed the decision of the lower court (15 Fed. 2nd 946). The Supreme Court denied a writ of certiorari.

With this encouragement, the Sorenson case was appealed, and the Circuit Court of Appeals of the Fourth Circuit fell in line with their brothers of the Ninth, reversing the case and allowing the assured to recover.

It, therefore, behooves P. and I. underwriters to be careful about the inclusion of the privity clause in their policies. The reasoning in the cases above cited was considerably clouded by the failure of the courts to distinguish between the personal privity question and the absence of a warranty of seaworthiness in a P. and I. policy. It seems hardly equitable that recovery should be allowed to an owner who is guilty of some definite sin of omission connected with a loss.

All the cases lay stress upon the fact that the owner would not be allowed to recover if his negligence was so gross as to amount to wilful, deliberate, and intentional wrong. But it is a pretty large order to prove that any particular privity or neglect was wilfull, deliberate, and with intent to defraud.

UNEASY DEAD

The fog descends and wets the tongues of bells
And smothers out the echo of the land that tells
The mariner of danger. From the heights
Unearthly devil-eyes that once were lights
Distil a thin green radiance tipped with hate—
Pale candelabra for the ships that missed the Gate.

The Stewart and the Coos Bay strain to hear
At midnight sounds unknown to human ear.
A-down the Gate—a burst of laughter and the throb of steam
From engines laboring to breast the stream.
A hail! The rattle of an anchor chain
Ahoy! What ship . . . . . ?
The Rio de Janeiro sails again.

J. A. Q.

Tug vs. Tow

A Discussion of Judicial Decisions Since the Salz Case

IN Pacific Marine Review for April of this year, we had occasion to set forth parts of the decision of the Supreme Court of the United States in the case of Sacramento Navigation Company versus Salz, reported in 1927 A. M. C. 397, holding that a tug and her tow form a single carrying unit and, as such, become entitled as a unit to the benefit of the Harter Act.

In that case, variously known as the Salz case, the San Joaquin No. 4, and the Tennessee, certain barley belonging to one Salz was being transported from Sacramento river points to Port Costa on a dumb barge drawn by a tug, both vessels belonging to the Sacramento Navigation Company. Due to the negligent navigation of the tug, the barge collided with the British steamship Ravenrock, causing the loss of the barley.

In the District Court and Circuit Court of Appeal, the cargo owner successfully contended that the Harter Act did not protect the barge against the result of the tug's negligence, and the libelant prevailed. In the Supreme Court, however, the case was reversed, the court using the following language:

"Considering the language of the bill of lading in the light of all the circumstances, it is manifest that

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we are dealing with a single contract and the use of the tug must be read into that contract as an indispensable factor in the performance of its obligations. To transport means to convey or carry from one place to another; and a transportation contract for the barge without the tug would have been as futile as a contract for the use of a freight car without a locomotive. In this view, by the terms of a contract of affreightment, in part expressed and in part necessarily resulting from that which was expressed, the transportation of the goods was called for not by the barge, an inert thing, but by the barge and tug, constituting together the effective instrumentality to that end."

The decision then goes on to point out that since the tug and tow were in effect a single instrument of carriage, the Harter Act should apply in the same manner as if the tow with her cargo were loaded aboard the tug. Thus a tug and her tow (and, inferentially, a tug and a line of tows) were held to be a "vessel" within the meaning of Par. 3 of the Act, which reads:

"That if the owner of any vessel transporting merchandise or property to or from any port in the United States of America shall exercise due diligence to make the said vessel in all respects seaworthy and properly manned, equipped and supplied, neither the vessel, her owner or owners, agent or charterers shall become or be held responsible for damage or loss resulting from faults or errors in navigation or in the management of said vessel . . ."

Salz Case Goes Marching On

It will be noted that three circumstances were present in the Salz case which might serve to distinguish it from other cases of the same general nature:

(1) The facts involved a third vessel, the Ravenrock, whose owners could legitimately regard the tug and tow as a single entity.

(2) The tug and tow were owned by the same party.

(3) The contract of affreightment was therefore a contract of carriage rather than of towage.

Subsequent courts, as is their custom, might have picked on any or all of these items as excuses for restricting or denying the mandatory authority of the Salz case. At the present writing, however, the indications are that the law, and even the dicta, laid down by the Supreme Court, will be religiously followed.

In the customary contract for handling barges, whether it be considered a contract of towage or of carriage, there will be found the inevitable clause exempting the towing vessel for liability as to her negligence. Now that the Harter Act is to be applied to a towing couplet in the same manner as to a single cargo vessel, the tug, under her carriage-towage agreement, is automatically exempted from negligence in navigation, whether or not the said exemption is expressly set forth.

As the tug usually has little or nothing to do with the handling of cargo as such, the remaining provisions of Section 3 of the Act will seldom apply. In other words, under the Salz decision and the Harter Act, a tug, with or without express exemption, is not liable for negligent navigation, which is about the only kind of negligence she can commit, provided due diligence has been exercised to make her seaworthy.

The Bathgate Case

On February 5, 1927, some two weeks prior to the Spreme Court's decision in the Salz case, the District Court for the Eastern District of Pennsylvania disposed of the case of the Insurance Company of North America versus steam tug Bathgate, involving the question of whether or not a tug was exempted, under the Harter Act, for negligent navigation which resulted in the loss of her tow's cargo.

The court held that a tug and tow did not constitute a "vessel" under the Act, and that exemption not afforded by the Act could not be acquired by contract. (See 1927 A. M. C. 475).

The Salz case immediately nullified this holding. In May of this year, the Bathgate matter came up for rehearing, and was reversed, the District Court opening the festivities with an apologetic attempt to pass the buck to the admiralty bar. Referring to its earlier decision the court says:

"The case was tried upon the doctrine accepted generally by the admiralty bar that the benefits of the Harter Act extended to carriers, but did not include towing vessels. The cause of action here was the negligence of a tug which had been guilty of 'errors of navigation.' There had been, however, an attempt to give the tug the benefits of the Act by contract. The sole question, therefore, became whether a tug could contract herself out of negligence. Shortly after the cause was ruled, the opinion in the San Joaquin No. 4—Tennessee; Sacramento Navigation Co. versus Salz was handed down, promptly followed by the motion to dismiss the libel herein, which is to be allowed or denied as a result of a re-argument in the light of this decided case. The reasoning of this case corrects the view of the admiralty bar."

The court then dismissed the libel, holding that the

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tug, having complied with the terms of the Harter Act, was free from liability for negligent navigation.

The Hugh O'Donnell

On September 12, of this year, the District Court for the Southern District of New York had before it a question involving the tug's right to the protection of the Harter Act when tug and tow were owned by different owners. The facts of the case were simple, involving collision and consequent damage to tows by reason of the negligent navigation of the tug.

"The question which arises is whether under these circumstances the owners of the tug can claim exemption under Sec. 3 of the Harter Act from liability for faults or errors in navigation after commencement of the voyage. There is uncontradicted proof that the tug was in all respects seaworthy and properly manned, equipped, and supplied when the voyage commenced in Buffalo. Under the decision of the Supreme Court in 'Sacramento Navigation Co., versus Milton H. Salz,' 1927 A. M. C. 397, the tug must be regarded as engaged in transporting the cargo carried on the barges, and entitled to the benefits of the Statute unless the facts of divided ownership as between the tug and her tow call for a contrary ruling. A reading of the decision and of the Statute affords no basis for such a distinction. The exemption is extended to the 'vessel, her owner or owners, agent or charterers' if the vessel is engaged in 'transporting merchandise or property.' The Hugh O'Donnell was not engaged on a towage contract. Under the agreement of her owners she was engaged with the Transit Company in the joint performance of a contract for the transportation of merchandise, in the performance of which the Transit Company and her owners were equally interested as carriers. If the tug had been engaged on a contract of towage pure and simple, perhaps it could be said that, having no interest in the transportation of the freight, she was not engaged in 'transporting merchandise or property,' within the meaning of the Statute. But that question does not arise here. In view of the arrangement under which the Transit Company and the Petitioners engaged in the business of carrying freight for their joint account, I see no escape from the conclusion that under the reasoning in the Salz case, supra, the tug was engaged in transporting the flaxseed carried on the barges, and being so engaged, that she and her owners were entitled to the exemption afforded by the Statute."

It looks as if the Salz case were to be followed without restriction.

Collision In Merry England

THE term "collision" in this country, and until now in England, has been considered to exclude striking against the ground.

In the Normandy, 90 L. T. Rep. 351, Sir Gorrell Barnes says: "It seems more correct to speak of a vessel stranding, or running, or striking upon or against rocks or the shore, than colliding therewith." American cases seem generally to support this conception of the word, which assumes that stranding and collision are mutually exclusive terms.

A recent English decision, however, seems to fly directly in the face of the former conception (Fruniz versus Royal Exchange Assurance, XVII Asp. 205). In that case, a hull policy contained a clause as follows: "Subject to the Institute 'Free of Particular Average Absolutely' time clauses as annexed but this insurance to include damage received by collision with any object (ice included) other than water."

On the 22nd day of September, 1924, the vessel stranded on a rocky bottom in Cuan Sound, off the west coast of Scotland, and was not refloated until October 4. The insurers admitted liability for the general average involved in getting the ship off, but denied liability for the particular average damage to hull.

The shipowners, on the other hand, contended that the contact with the shore was a collision within the meaning of the policy.

So far everything is according to Hoyle. The only disturbing thing about it, as the Irishman said when he fell off the roof, is the ending. For the court gravely examined the policy, dismissed the existing English and American decisions, and allowed the shipowner to recover. In discussing Union Marine Insurance Co. versus Borwick, 73 L. T. R. 156, he says, "I do not find anything to show that the words 'stranding' and 'collision' were regarded by the learned judge as mutually exclusive."

He then goes on to hold that the vessel collided with Scotland, saying, "The words are very wide: 'collision with any object,' and I think that by 'any object' is meant 'anything,' and one natural object is included, namely ice, and another natural object is excluded, namely, water. This directs me to the conclusion that in this policy contact with a natural object, such as contact with rocky ground, is included and covered by the policy."

The insurer unquestionably did not intend to cover such an accident. We hope the case is carried to an appeal, so that we may better judge if we are wrong in considering it revolutionary.

Balfour, Kessler Agencies *Inc.*

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Mixed Cargo

And now we hear that the steamship President Pierce has had a fire in her refrigerator space. That must be the height of something or other.

Shipping and insurance experts, in common with the rest of mankind, have all become specialists. The day of the old fashioned surveyor has gone—he must now particularize.

"My, how you do specialize," as the sweet young thing said to the ship's officer when she learned that he was a naval surgeon.

Speaking of specialists reminds us of Bill Herron's definition on the subject.

"A specialist," says Bill, "is a fellow who knows more and more and more and more about less and less and less and less, until finally he knows everything about nothing, and becomes a scientist.

"And a generalist is a bird who knows less and less and less and less about more and more and more and more, until, at last, he knows nothing about everything, and then he becomes a philosopher."

The Study Class of the Association of Marine Underwriters of San Francisco opened its seventh term on Wednesday evening, October 5. Meetings will be held thereafter on alternate Monday evenings during the winter months, at which speakers on various marine insurance and shipping topics will do their best to pierce the gloom of ignorance and lead the struggling footsteps of their fellow men into the golden paths of knowledge and all that and all that.

In spite of the professed aim of the organization, it has been growing steadily more popular, as shown by the attendance of sixty members at the first meeting of the season.

The record attendance was in part, of course, a direct tribute to the speaker of the occasion, Warren H. Pillsbury, district commissioner under the Federal Longshoreman's Compensation Act, and former attorney for the State Industrial Accident Commission. Mr. Pillsbury, after giving a brief summary of the admiralty law applying to injuries of maritime workers as set forth in the Osceola case, proceeded to trace the conflict between admiralty law and state jurisdiction in recent years, citing the Knickerbocker Ice Company case, the Grant Smith Porter case, and the case of the Southern Pacific vs. Jensen. He then went on to outline the jurisdictional extent of the present Federal Act, of which he is a district commissioner.

"This act," said Mr. Pillsbury, "applies only where the state compensation acts clearly do not apply. Thus the federal measure has nothing to do with injuries to stevedores occurring on shore, where the state's power is unquestioned. As the Act expressly disclaims jurisdiction over seamen, its scope is thus restricted to longshoremen and other harbor workers aboard ship."

As with any new measure, there are certain rough spots which can only be ironed out by trial trips, but, on the whole, the Federal Act promises to employer and employee, not to mention the insurance carrier, a clearing up of doubt regarding vexed personal injury questions.

Trade Literature

Falk Speed Reducers. The Falk Corporation has issued Bulletin No. 160. This is an excellent typographical compilation of 48 pages, featuring information and pictures setting forth the full standard line of Falk herringbone gear speed reducers. This reducer is manufactured in three types, single, double, and triple reduction. The speed ratio range is up to 10 to 1 in single reduction units, and from 70 to 1 up to 300 to 1 in triple reduction units.

In these units Falk guarantees finished accuracy of gear tooth and conservative transmission capacity rating under continuous full power operation. Small gears are cut from high capacity steel forgings. Large gears are cast from Falk special Telastic steel.

Falk Flexible Couplings. The Falk Corporation Bulletin No. 150. A 12-page pamphlet describing and illustrating the famous Bibby coupling as improved and manufactured for American use by Falk Corporation. This coupling is both flexible and elastic, thereby not only compensating for misalignment but also absorbing shock and vibration.

E. C. Myers, California representative of the Falk Corporation, is located at San Francisco.

Bethlehem Steel Company, has issued Catalog J covering **Bethlehem Pulverizers,** which may be obtained from their headquarters at Bethlehem, Pennsylvania, or any of their branch offices.

In view of the recent experiments in the burning of pulverized fuel under boilers in marine power plants, this catalog should interest many of our readers who are following the developments along this line.

The Maxim Silencer Company, Hartford, Connecticut, has recently published a new and well illustrated bulletin which is creating considerable interest in shipping and industrial circles.

The bulletin explains fully the application of the Maxim Silencer to every form of gas pulsation and sound wave that is generated by engines, air compressors, blowers, pumps, and similar machinery.

Westinghouse Electric & Manufacturing Company has recently sent out a very beautiful publication covering twenty-one marine installations of diesel-electric power plants using Westinghouse equipment. The photographs, and in fact the entire booklet, are printed in colors, and nineteen of the views are accompanied by blue-prints showing the plan and elevation of the engine room arrangement. In addition there are two pages of text briefly enumerating the advantages of this type of propulsion and a double page spread of cuts of auxiliary equipment.

Organization and Trade Notes

New Marine Equipment and Construction Service

SUTOR and Company of Los Angeles, in response to frequent requests for service, equipment, and information coming from central and northern California, has recently opened an office in San Francisco. This office is being conducted under the direction of Frederick A. Smith, who for many years has been associated with the American Foundry Equipment Company in Indiana.

W. F. Sutor, general manager of Sutor and Company, and Frederick A. Smith have both had broad experience in the field covered by their activities, and their practical and theoretical knowledge enables them to give expert advisory service to their many clients.

Frederick Smith.

Among the items handled by this concern are many that are of interest to the shipbuilder, ship repairer, and ship operator. These include electric rivet heaters, with a range of capacity that covers gang driving or miscellaneous maintenance and repairs; electric arc welding outfits; positive pressure blowers for oil burners or for conveying or pumping liquids; positive exhausters for unloading, conveying, or ventilating; sand blast apparatus for removing scale and barnacles in preparation for repainting and for all cleaning operations; magnetic pulleys for separating metallic and nonmetallic materials; dust arresters; melting furnaces in capacities suitable for providing a small nonferrous foundry aboard ship for miscellaneous repairs; alligator shears for scrap yards and salvage work.

The organization of Sutor and Company is made up of men who have been trained to adhere strictly to the maxim "Never Guess" and have all learned to admit frankly when they do not know the answer to a problem that is presented to them. In the fields of sheet metal and foundry work, this firm has achieved a very enviable reputation for efficiency and resourcefullness in handling difficult problems. The establishment of the new office in San Francisco will make this experience more available to the industries of central and northern California.

Worthington Announcement

THE Worthington Pump and Machinery Corporation is centralizing its diesel engine building activities in the Snow Works of the corporation at Buffalo. The best of the equipment formerly used at the Blake and Knowles Works for the building of smaller sizes of diesel engines has been moved to the Snow Works, where all of the internal combustion engine lines, including the Worthington large compressor gas engines, are now being built. This move on the part of the Worthington company means the concentration at the Buffalo works of the entire diesel engineering talent of the corporation and the opportunity given to that talent to use the very finest of facilities in manufacturing their improved designs.

It was at the Snow Works that the large double-acting United States Shipping Board diesel engines for the motorships Tampa and Unicoi were built. These engines have been giving a very good account of themselves and have evoked much widespread favorable comment.

President Belnap of the Worthington corporation announced in a recent interview that this concentration of Worthington facilities and talent "marks a lap in America's race for diesel power supremacy, as well as an important step in this corporation's progress toward increased efficiency in economical operation."

Fred Moon Joins C. E. Rhodes Co.

Fred Moon, for many years with the Shipping Board and other large organizations as engineer, is now with the C. E. Rhodes Co., San Francisco, packing and marine supplies. Mr. Moon's thorough knowledge of the needs of marine engines and engineers in the way of packing problems will be freely at the disposal of clients of the firm with which he is now associated.

L. O. Kuhn Impressed by West Coast Shipping

PACIFIC Coast shipyards are busier than marine plants of the East, and the steadily growing number of craft of all classifications engaged in Western passenger and freight movement are facts to focus equipment manufacturers' attention to the Pacific Coast. So says L. O. Kuhn, vice-president and general manager of the Northern Pump Company of Minneapolis, who is making a tour of Pacific Coast ports with Messrs. Remi Knight and Lyman King, of the King-Knight Company, Northern's western representatives.

During 1927 more Eastern manufacturers have come out to the Pacific Coast for a first-hand "look see" than at any period to date. For some American marine equipment manufacturers to gaze solely upon the "Eastern range" is to shut their eyes upon half of the American market.

God's country offers the marine equipment builder two markets—and the growing one is the Pacific Coast!

American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

SHIPPING BOARD AWARDS IMPORTANT CONTRACTS

The Shipping Board, on October 13, directed that contracts be awarded for the conversion of the three freighters from steam to diesel-electric drive. The awards were:

For the steamship Courageous by the Federal Shipbuilding Company, cost $1,319,000; steamship Defiance by the Norfolk Navy Yard, cost $1,192,000; steamship Triumph by Boston Navy Yard, cost $1,315,000.

The vessels will be equipped with McIntosh & Seymour diesel engines, the cost of which is included in the contract prices. The prices also include the cost of generators and other machinery and all auxiliaries, certain modifications to the ships' hull lines in order to aid in increasing the speed of the vessels, which it is estimated will be increased from 10 knots to between 13 and 14 knots. As converted, the ships will be of 10,500 deadweight tons each and will have 600,000 cubic feet of cargo space.

The plans for converting these vessels have been drawn up under the direction of William Francis Taylor, U.S.N. Retired.

TOWBOAT FOR HONOLULU

Bids will be called soon for a new tugboat, a sister to the Mahoe, to be used for hauling pineapple barges to Honolulu canneries from Molokai by Young Brothers, Ltd., of Honolulu. John A. Young, general manager of the company, arrived in Seattle October 1 to arrange for the construction of the tugboat.

L. H. Coolidge, naval architect of Seattle, is preparing plans for the vessel and will supervise its construction. The tug will be 125 feet long and will be powered with a 840-horsepower Fairbanks-Morse full diesel engine and a 56-horsepower Fairbanks-Morse new type generator. Allan Cunningham equipment has been specified and will include steering engine, towing engine, and bow capstan. The tug will be equipped with wireless equipment for both receiving and sending and with refrigerating galley equipment.

The new tug will be slightly larger than the Mahoe, built for this company in 1925, by the Ballard Marine Railway Company of Seattle, which has been giving entire satisfaction to her owners.

CAR FERRY PLANNED

According to report from the East, the Grand Trunk Milwaukee Car Ferry Co. of Milwaukee, is planning the construction of a car ferry for operation between Grand Haven, Michigan, and Milwaukee, Wisconsin. This company received delivery of two 360-foot car ferries from the Manitowoc Shipbuilding Company in 1926.

PLANS FOR FIREBOAT

The City of Vancouver, British Columbia, has under consideration plans submitted by Arthur Bennett for a fireboat 60 feet over all, 15 feet beam, and 3 feet draft to be powered with gas engines, the total pumping capacity being 5000 gallons a minute at 120 pounds pressure.

The City Council of Vancouver plans to build this boat for the protection of False Creek waterfront property, the cost of construction being gradually repaid to the Vancouver Council.

KEY SYSTEM PLANS

All legal obstacles in the way of inauguration of an automobile carrying service between San Francisco and Oakland have been cleared from the path of the Key System Transit Company and plans are being drawn up with this end in view.

The first step in the work will be the rebuilding of the Key System mole on the Oakland side, and the widening of the full length of the mole for the accommodation of a viaduct for vehicles. The new service will also require the construction of new ferryboats or the rebuilding of the ones now in service, as all of the Key System's ferryboats are built for passenger accommodation only.

Dredge R. W. Atkinson ready to be towed to Honolulu. The dredge was recently built by the Pacific Coast Engineering Company, Oakland, Calif., for the Hawaiian Dredging Company.

SMALL CRAFT FOR S. F.

It has recently been reported that the San Francisco Bay Pilots, with offices in the Ferry Building, San Francisco, are planning the construction of a new bar pilot boat, which will probably be powered with diesel engines. Captain John Wallace is port engineer.

As announced before, the Board of State Harbor Commissioners is planning to build a new dredge. The work will be in charge of Chief Engineer White, with offices in the Ferry Building.

Bids will be received by the Board of State Harbor Commissioners at the Ferry Building, San Francisco, on November 2 for the construction of a pile driver scow.

The river freighter Fletcher owned by the Wheeler Transportation Company of Stockton, and valued at $140,000, was destroyed by fire on October 8.

CUBA PLANS FERRY FOR AUTOS FOR FLORIDA

The Cuban Government plans to operate ferries from Key West to Havana for the transportation of motor cars and passengers between the two cities upon completion of the new Overseas Highway from the Florida mainland to Key West.

According to word received from the office of the Mexican Consul General at New York, the proposed purchase of two passenger and freight vessels for the National Navigation Lines of Mexico has been postponed for the present.

According to a report from Vice-Consul R. Hudson Fetner at Buenaventura, the Colombian Senate has approved a project for the formation of a Colombian merchant marine, which calls for the purchase of three vessels for regular service between Buenaventura and New York.

Some Recent Shipbuilding Orders

Dravo Contracting Company' Pittsburgh, has an order from the Ohio River Sand Company, Louisville, Ky., for a steam dredge 155 by 44 by 8 ft., of 480 gross tons.

Nashville Bridge Company, Nashville, Tenn., has an order for two stock deck barges 100 by 24 by 5 ft.

Bethlehem Shipbuilding Corp., Union Plant, San Francisco, has an order for a steel car float for the Atchison, Topeka and Santa Fe Railroad of San Francisco, to be 260 feet long, 36 beam, and 12 feet 6 inches loaded draft.

American Brown-Boveri Electric Corp., Camden, N. J., has an order from the International Cement Corporation for a cement barge, 163 ft. 6 in. by 37 ft. 4 in. by 13 ft.

Midland Barge Co., Midland, Pa., has an order from the International Petroleum Co., for one steel derrick boat 70 by 3 by 6 ft.

Federal Shipbuilding & Drydock Company, Kearny, New Jersey, has an order from the Hartol Products Company, 256 Broadway, New York, for an oil barge to be built on the Isherwood system of bracketless framing, 175 by 36 by 12 ft. 6 in.

Campbell Machine Works, San Diego, has an order for a 110-foot yacht for Baron Long of Tia Juana, to be powered with a 300-horsepower Union diesel engine.

Skansie Drydock & Shipbuilding Company, Gig Harbor, Wash., has an order from the Washington Navigation Company of Seattle for a 65-foot ferryboat to be powered with an 80-horsepower Fairbanks-Morse diesel engine.

Hoffar-Beeching Company of Vancouver, B.C., has an order from the British Columbia Department of Marine and Fisheries for three fishery patrol boats 52 over-all by 11 feet by 5 feet draft, to be equipped with 65-horsepower Thornycroft gas engines.

Wallace Shipyards, Ltd., North Vancouver, B.C., has an order from the Royal Canadian Mounted Police for a cruiser 95 by 24 by 12 feet, and will be of specially strong construction for Arctic patrol. Accommodations will be provided for 13 officers and men.

Wallace Bridge and Structural Steel Company, Seattle, has an order from the Pacific Gas and Electric Company of San Francisco for a cable laying barge for San Francisco Bay. The barge will be built on the Ellis Channel System of steel hull construction, 100 by 40 by 12 feet and will be equipped with a logging hoise boiler, a 20-ton derrick.

AGAMMENON AND MOUNT VERNON MAY BE RECONDITIONED

Reports are received from the East to the effect that the Shipping Board has authorized Admiral Taylor to work in conjunction with Gibbs Brothers of New York and draw up plans for the reconditioning of the steamers Agammenon and Mount Vernon as running mates for the Leviathan. It is estimated that the work will cost in the neighborhood of $6,000,000 for each vessel.

POWER BOAT FOR VANCOUVER

The Canadian Customs Department at Vancouver has asked for bids to be submitted for the construction of a 50-foot seagoing powerboat of great strength and speed.

DRY-DOCK FOR KEY WEST

The Key West Wharf and Warehouse Corporation, Key West, Florida, has received the approval of the War Department for the construction of a wharf, slips, and drydock, together with the necessary dredging work.

NEW DRY-DOCK FOR ALAMEDA

The General Engineering and Dry-Dock Company is in the market for a 15,000-ton floating drydock for its Alameda plant.

According to the Bureau of Foreign and Domestic Commerce, Reference 12204, a firm at Medicine Hat, Alberta, Canada, is in the market for one or more gold dredgers.

Theodore E. Ferris, New York, has plans for two colliers for Berwind-White Company, bids for which will be asked shortly.

The Matson Navigation Company has announced that the liners Maui and Matsonia will be laid up at San Francisco in November for extensive improvements to their passenger accommodations, including the installation of twin beds and hot and cold running water in every room. The Simmons Company has already received an order for the beds and for some Pullman berths.

YACHTS PLANNED AT NEW YORK

John H. Wells, naval architect, is preparing plans for a 150-foot diesel yacht.

Henry J. Gielow, Inc., is reported to have plans and specifications for a 340-foot diesel yacht which will be available shortly.

Tams & King have asked for bids for construction of a 210-foot diesel yacht.

The Department of Plant and Structure, New York City, has plans for a 264-foot steam ferryboat. R. W. Morrell is naval architect and A. Goldman is Commissioner of the Department.

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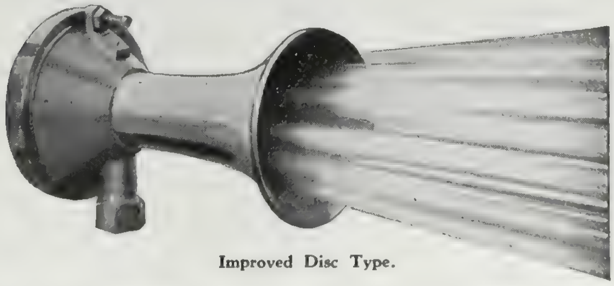

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LARGE YACHT BUILDING AT BOSTON

We are publishing herewith an artist's drawing of a 225-foot steel twin screw diesel yacht which is now building at the George Lawley & Son Corporation plant in Boston from the designs of Henry J. Gielow, Inc. of New York for Julius Fleishmann of Cincinnati.

This craft will be built entirely of steel, classed to Lloyd's 100 A-1 plus. She will be powered with a pair of 800-horsepower Bessemer type diesel engine, to give her a cruising radius of 10,000 nautical miles at 14 knots speed.

Accommodations will be provided for owner and guests in the eight large staterooms, with connecting baths, and a large living-room, large dining room, and gymnasium. Interiors will be finished entirely in beautiful hardwood with tinted paints, and all exterior woodwork will be of teak.

The yacht will be equipped with electric windlass, electric boat hoist, Sperry "Metal Mike" and Gyro-compass equipment, and all modern appliances to make her thoroughly comfortable and seaworthy.

RADIO COMPASSES ORDERED

Nine Kolster radio compasses have been ordered from the Federal Telegraph Company of San Francisco by Herbert K. Oakes of Cleveland for the installation on Great Lakes vessels. Six are to be installed on the ore-carrying vessels of the Bethlehem Transportation Corporation, one for the Franklin Steamship Company, and two for the Cambria Steamship Company.

MOJEAN AND ERICSON LAUNCH TUG

Built for the Magnolia Tugboat Company of Tacoma, the tug Captain O. G. Olson was launched by Mojean and Ericson on September 23 and went into service last month. The tug is equipped with a 240-horsepower Fairbanks-Morse diesel engine. The cost of the tug was $50,000.

PASSENGER STEAMER FOR EAST COAST

The Pennsylvania Railroad, New York, opened bids in September for construction of a passenger steamer, sister ship to the Maryland, to be 250 feet long and powered with steam engines.

Wash drawing by C. McKnight Smith of the new yacht designed by Henry J. Gielow, Inc., for Julius Fleishmann of Cincinnati.

Some Important Repair Awards

Todd Dry Docks, Inc., Seattle was awarded contracts for repairs to the steamers Pomona of the Weyerhauser Timber Company and the Nyhaug of the Comyn fleet, cost of which will aggregate $90,000. The Pomona's bow was badly crushed in collision with the Richfield tanker Kekoskee near Point Arguello on October 11. The Nyhaug grounded when outward bound from Victoria, denting some of her plates.

The Hanlon Dry Docks & Shipbuilding Company of Oakland was awarded the contract for repairs to the California Petroleum Company's tanker Winifred O'Donnell, which went ashore in the fog at Honda Bay on October 12. The Hanlon company submitted a low bid of $43,480 and 19 days for the work. When the vessel was drydocked for survey after having been towed to San Pedro, it was discovered that 45 of her hull bottom plates were damaged, 21 of which must be renewed and the others faired. Her frame structure and machinery were undamaged.

Bethlehem Shipbuilding Corp., San Francisco, was given contract for repairs to the Plant Line freighter Circinus, which was seriously damaged when she stranded on Descanso Point, Mexico, last month. The sum submitted by the Bethlehem was $188,888 and 70 days.

Bethlehem Shipbuilding Corp., Union Plant, was awarded contract for repairs to the steamship Kekoskee on a low bid of $78,888. Work will be done at the San Pedro Works.

The tanker Kekoskee of the Richfield Oil Company was another victim of the early autumn fogs off Point Arguello, when she was rammed near her engine room bulkhead by the steamer Pomona on October 11. The Pomona continued on to Seattle, but the engine room of the Kekoskee was flooded, necessitating towing the vessel to San Pedro, for survey of the damage.

The purse seiner Astorian, after being aground four days off Long Beach, was floated on October 14 and was taken into San Pedro for repairs, her entire forward section of bottom being torn away.

KEEL LAYINGS, LAUNCHINGS, DELIVERIES

Steel carfloat for Atchison, Topeka & Santa Fe Railway, by Bethlehem Shipbuilding Corp., San Francisco, Sept. 27.

Steel barge for U.S. Engineers by Howard Shipyards & Dock Co., Sept. 30; two steel barges for Pine Bluff Sand & Gravel Co., September 15.

Bay steamer for Chesapeake Steamship Co., by Newport News Shipbuilding & Drydock Co., Sept. 28.

Night passenger and freight vessel for Baltimore Steam Packet Co., by The Pusey & Jones Corp., Sept. 20.

Steel hull diesel-electric towboat for U.S. Engineers by The Chas. Ward Engineering Works, Sept. 22.

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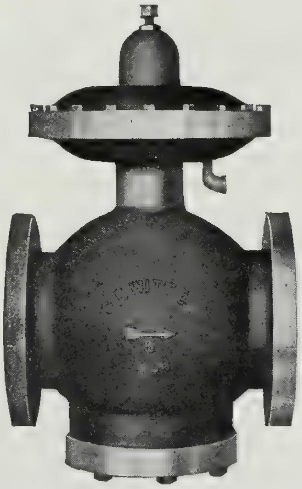

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LAUNCHINGS

California, turbo-electric passenger liner for Panama Pacific Line by Newport News Shipbuilding & Drydock Co., Oct. 1.

Savarona, twin-screw diesel yacht for Richard Cadwalader, Jr., by The Pusey & Jones Corp., Sept. 12.

DELIVERIES

Steel Carfloat to Southern Pacific Co. by the Moore Dry Dock Co., Oct. 9.

Eight covered barges to Inland Waterways Corp. by American Bridge Co., Oct. 1.

Carfloat to Pennsylvania Railroad Co. by American Brown Boveri Electric Corp., Sept.

Sand Merchant, sand carrier to Interlake Transportation Co., by Collingwood Shipyards, Ltd., Sept. 10.

Carfloat to Lehigh Valley Railroad by Federal Shipbuilding & Drydock Co. Sept. 9; carfloat to D. L. & W. Railroad, Sept. 29.

Four cabin barges to Inland Waterways Corp. by Midland Barge Co., during Sept.

Dredge to McWilliam Dredging Co. by Nashville Bridge Co., Sept. 1; steel steamboat hull to Big Rock Stone Co., Sept.

Barge to Merritt, Chapman & Scott Corp. by Newport News Shipbuilding & Drydock Co., Sept. 9.

Axtell J. Byles, bulk oil steamer to Tidewater Oil Co. by Sun Shipbuilding Co., Sept. 18.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of October 1st:

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD,. UNION PLANT

Potrero Works, San Francisco

Purchasing Agent: O. W. Streett.

Steel dredge hull for U.S. Smelting, Refining & Mining Co., Oakland, Calif.; 128x60x12 ft.; 10 cu. ft. buckets; deliver Nov. 1/27 est.

Two steel dredge hulls, sisters to above; 148x60x12 ft.; 10 cu. ft. buckets; deliver one Nov. 1/27 est.

Steel dredge hull, sister to above; 168x60x12 ft.; 10 cu. ft. buckets.

Three steel dredge hulls, sisters to above. 100x50x11′4″; 6 cu. ft. buckets.

Barge No. 6, hull 5334, steel carfloat for Atchison, Topeka & Santa Fe Railway; 260 L.B.P.; 38 beam; 12′6″ loaded draft; **keel Sept. 27/27;** launch Nov. 15/27 est.

Not named, hull 5335, twin screw passenger and freight vessel for Inter-Island Steam Navigation Co., Ltd., Honolulu; 295′ L.B.P.; 48′ beam; 17′4½″ loaded draft; 15 knots loaded speed; 1800 D.W.T.; Westinghouse complete expansion geared turbines and electric motors; 400 S.H.P.; 4 Babcock & Wilcox water-tube boilers; 12,268 sq. ft. heating surface; keel Nov. 15/27 est.

GENERAL ENGINEERING & DRY-DOCK CO.,

Alameda, California

Purchasing Agent: Al. Wanner.

Not named, hull 12, diesel-electric wooden auto ferry for Golden Gate Ferry Co.; 240 L.O.A.; 44 beam; 10′6″ loaded draft; 3 400 H.P. Ingersoll-Rand diesel engs.; Westinghouse 950 S.H.P. motors; keel Oct. 25/27 est.; deliver March 1/28 est.

J. C. JOHNSON'S SHIPYARD

Port Blakely, Wn.

T. T. & B. Co. No. 14 scow for Tacoma Tug and Barge Co., Tacoma; 100 x 36 x 8′8″; launched June 21/27; **delivered July 12/27.**

Reed No. 6, scow for Reed Mill Co., Shelton, Wn.; deliver Oct. 6/27 est.

Hull 122, scow for stock, 100 x 36 x 9′6″; launched July 29/27.

Hull 123, scow for stock, 100x36x9′6′; launched Aug. 3/27.

Hull 124, self-dumping gravel scow for Pioneer Sand and Gravel Co., Seattle; 100x36x11 ft.

THE MOORE DRY DOCK COMPANY

Oakland, California

Secretary and Purchasing Agent, Nat Levy.

Hull 174, steel carfloat for Southern Pacific Co.; 258 by 38 by 7′9″ loaded draft: 14 cars capacity; keel June 20/27; **launched Sept. 26/27; delivered Oct. 9/27.**

PACIFIC COAST ENGINEERING CO.,

Oakland, Calif.

Alki, hull No. 4, fireboat for City of Seattle; 123 L.O.A.; 26 moulded beam, 7′6″ draft; 14 knots speed; seven 6-cyl. 300-H.P. Winton diesel engs.; keel July 7/27; launch Nov. 5/27 est.

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R. W. Atkinson, hull No. 5, dipper dredge hull for Hawaiian Dredging Co., Honolulu; launched June 30/27; **delivered Sept. 24/27.**

U. S. NAVY YARD,
Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Fifteen covered barges for Inland Waterways Corp., Washington, D.C.; 126'x33'x7'6"; **8 delivered Oct. 1/27.**

Two barges for Anderson & Tully, Memphis, Tenn.; 160x34x7'6".

Twelve barges for Tennessee Coal, Iron and Railway Co., Birmingham, Ala.; 140x25x11ft.

AMERICAN BROWN-BOVERI ELECTRIC CORP.,
Camden, N. J.

Purchasing Agent: L. G. Buckwalter.

Hull 372, carfloat for Pennsylvania R.R. Co.; 185'x34'x9'6"; keel June/27; launched Aug. 27/27; **delivered Sept./27.**

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; deliver July 9/29 est.

Not named, light cruiser CL- 27 for United States Navy, 10,000 tons displacement; deliver June 13/30 est.

Hull 373, cement barge for International Cement Corp.; 163'6"x37'4"x13'.

THE AMERICAN SHIP BUILDING COMPANY,
Cleveland, Ohio.

Purchasing Agent, C. H. Hirsching.

Harry Coulby, hull 798, bulk freighter for Pickands, Mather Co.; 607' L.B.P.; 65' beam; 33' loaded draft; 13 mi. speed; 13,800 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 B. & W. boilers; 200 lbs. pressure; keel Feb. 7/27; launched April 30/27.

Not named, hull 800, bulk oil barge for Standard Transportation Co.; 258 L.B.P.; 40 beam; 10 draft; keel Mar. 21/27 est.; launch Aug. 7/27 est; deliver Aug. 15/27 est.

Not named, hull 801, oil barge for Standard Transportation Co., sister to above; keel March 21/27; launch Aug. 7/27 est., deliver Aug. 15/27 est.

Not named, hull 802, tank steamer for Standard Oil Co. (Indiana); 373 L.B.P.; 52 beam; 20 loaded draft; 12 mi. loaded speed; 6200 D.W.T.; 1800 I.H.P. triple expansion engs., 2 Scotch boilers, 15'x4½"x11'6"x180 lbs. pressure.

Not named, hull 803 motor tanker Roxana Pet. Corp., St. Louis; 334 L.B.P.; 51 beam; 18 loaded draft; 11½ mi. loaded speed; 3700 D.W.T.; 1900 I.H.P. Werkspoor diesel engs.; aux. Scotch boiler.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT,
Quincy, Mass.

Lexington, hull 1300, airplane carrier U. S. N., launched Oct. 3/25.

Hull 1408, oil tank barge for the Cities Service Refining Co.; 150 ft.; 7000 bbls. capacity.

No. 45, electric cutter for U. S. Coast Guard Service; 250x42x15 ft.; Westinghouse turbines and motors; 3000 S.H.P.

No. 46, sister to above.

No. 47, sister to above.

No. 48, sister to above.

No. 49, sister to above.

COLLINGWOOD SHIPYARDS, LTD.
Collingwood, Ontario

Purchasing Agent: E. Podmore.

Sand Merchant, hull 79, sand carrier for Interlake Transportation Co., Ltd., Montreal; 252 L.B.P.; 43'6" beam; 2200 D.W.T. on 14' draft; T.E. engs., 700 I.H.P., 2 Scotch boilers, 13' diam.; keel Apr. 28/27; launched Aug. 17/27; **delivered Sept. 10/27.**

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Hull 2872, cruiser for B. H. Borden, 95x16 ft.; 2 Model R Speedway engs., 300 H.P. each

Hull 2874, cruiser for Clifford V. Brokaw; 85x14ft. 6in.; 2 Model R. Speedway engs., 300 H.P. each.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.,
Philadelphia, Pa.

Purchasing Agent: John A. Budd.

Malolo, hull 509, express psgr. and frt. liner, Matson Navigation Co.; 582 L.O.A.; 577 length at water line; 83 ft. beam; depth molded to C deck 54 ft.; displacement 22,050 tons; 8250 DWT; speed 22 knots regular; 23 knots maximum; 25,000 shaft horsepower; Cramp-Parsons turbines; oil burning B. & W. water tube boilers; keel May 4/25; launched June 26/26; deliver Oct. 27/27 est.

Evangeline, hull 524, twin screw passenger and freight steamer for Eastern Steamship Lines; 378 length at water line; 55'6" beam; 29'6" molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears; 6 single-ended Scotch boilers; keel May 1/26; launched February 12/27; deliver Oct. 1/27 est.

DEFOE BOAT & MOTOR WORKS,
Bay City, Mich.

Purchasing Agent: W.E. Whitehouse.

Grathea II., hull 125, yacht for E. T. Strong, Flint, Mich.; 57'x13'x4'; 13 mi. loaded speed; 22 D.W.T.; 200 I.H.P. gas engs.; keel Aug. 1/27; launch and deliver Apr. 1/28 est.

Not named, hull 123, steel yacht, owner not named; 105 L.B.P.; 17 beam; 6 loaded draft; 13 loaded speed; 110 D.W.T.; 120

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I.H.P. diesel eng.; keel July 11/27; launch Apr. 15/28 est.; deliver June 1/28 est.

DRAVO CONTRACTING COMPANY,

Pittsburgh, Pa.

Hulls 588-590 inc., 3 standard steel barges for stock; 100x26x6 ft. 6in.; 135 gro. tons each .

Hulls 591-600 inc., 10 standard steel barges for stock, 100x26x6ft. 6in.; 135 gross tons each.

Hulls 605-612 inc., 8 steel barges for Keystone Sand & Supply Co., 135x27x8ft.; 320 gr. tons each.

Hulls 615 and 616, two 120-H.P. stern wheel diesel towboats for stock; 74ft. 2in. x16ft. x 4ft.; 320 gro. tons each.

Hulls 625 and 626, two covered oil barges, steel decks, for International Petroleum Co., Montreal; 100'x30'x6'6"; 180 gross tons each.

Hulls 632-634 inc., three complete maneuver hulls for U. S. Engineers, Pittsburgh, 93 gro. tons each.

Hulls 635-644 inc., ten covered steel barges for Inland Waterways Corp., Washington, D.C.; 126x33x7'6"; 485 gro. tons each.

Hulls 652-653, two steel deck scows for U.S. Engineer Office, Philadelphia; 102x30 x10 ft.; 400 gro. tons each.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY

Kearny, N. J.

Purchasing Agent, R. S. Page.

Dixie, hull 89, passenger and freight steamer for Southern Pacific Steamship Lines, Pier 49, North River, New York; 427 L.B.P.; 60 beam; 25'6" loaded draft; 6700 D.W.T.; De Laval steam turbines; 7700 S.H.P.; 4 B. & W. boilers, 21,900 sq. ft. heating surface; 16,000 sq. ft. superheating surface; keel Jan. 31/27; launched July 29/27.

Hull 92, carfloat for Lehigh Valley R. R.; 278 x 39 x 10 ft.; keel June 6/27; **launched Sept. 3/27; delivered Sept. 9/27.**

Hull 93, carfloat for D. L. & W. Railroad, 278 x 39 x 10ft.; keel June 20/27; **launched Sept. 28/27; delivered Sept. 29/27.**

Hull 94, same as above; keel July 21/27.

Hull 95, same as above; keel Aug. 22/27.

Hull 96, carfloat for the Pennsylvania Railroad; 250x34x9 ft.; keel Aug. 8/27.

Hull 97, carfloat, sister to above.

Hull 98, carfloat, sister to above.

Hull 99, carfloat, sister to above.

Hull 100, oil barge for Hartol Products Co., New York; 175x36x12'6"; Isherwood bracketless framing.

GREAT LAKES ENGINEERING WORKS,

River Rouge, Mich.

Purchasing Agent: Chas. Short.

Hull 258, flat scow for Great Lakes Dredge & Dock Co., 165 x 42 x 12 ft.; keel Dec. 1/27 est; launch Jan. 31/28 est; deliver April 1/28 est.

Hull 259, flat scow, same as above; keel Dec. 1/27 est.; launch Jan. 31/28 est.; deliver April 1/28 est.

HOWARD SHIPYARDS & DOCK COMPANY,

Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hull 1601, hull for Baton Rouge Car Terminal, Baton Rouge, La.; 285'x60'x9'6"; keel March 30/27; launched July 9/27; **delivered Oct. 5/27 .**

Hull 1627, steel barge for U. S. Engineers, St. Louis, Mo.; 100x25x5ft.; **keel Sept. 30/27.**

Hull 1628, same as above.

Hull 1629, same as above.

Hull 1630, same as above.

Hull 1631, same as above.

Hull 1632, same as above.

Hull 1633, steel barge for Pine Bluff Sand and Gravel Co., Pine Bluff, Ark.; 100x25x5 ft.; **keel Sept. 15/27.**

Hull 1634, same as above; **keel Sept. 15/27.**

MANITOWOC SHIPBUILDING CORPORATION

Manitowoc, Wis.

Purchasing Agent, H. Meyer.

Not named, hull 234, river car ferry for Pere Marquette Railway Co.; 400 L.O.A.; 53 beam; 22 depth; 4 P.M. boilers; two 3-cyl. comp. engs.; launch Sept. 15/27 est.; deliver Nov./27 est.

MARIETTA MANUFACTURING COMPANY

Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Stern-wheel towboat for Magdalena River, Colombia; 168x42x5 ft.; keel Aug. 4/27;

Stern wheel tugboat for Magdalena River, Colombia; 173x44x5ft. 6in.; keel Sept. 1/27; launch Nov. 15/27 est.

Stern wheel towboat for Magdalena River, Colombia; 168x42x5ft.; keel Nov. 1/27 est.

Eight steel hoppered cargo barges for Magdalena River, Colombia; 125x26x6 ft.

MIDLAND BARGE COMPANY

Midland, Pa.

One dredge hull for River Sand Co.; 131x30x5 ft.; deliver Oct. 15/27 est.

Four-sectional dry-dock for International Petroleum Co. of Montreal; 70x44ft.; **three sections launched;** deliver Dec. 1/27 est.

One steel flush deck barge for Dillman Egg Case Co.; 180x36x7 ft.

Fifteen cabin barges for Inland Waterways Corp., Washington, D. C.; 126x33x 7ft. 6in.; **4 delivered.**

Five barges for Inland Waterways Corp., 126'x33'/x7'6".

Not named, towboat for E. T. Slider, New Albany, Ind.; 145x32x5ft. 6in.; keel March 1/28 est.

One barge for Anaconda Copper Mining Co.; 115x34x10 ft.; keel Oct. 10/27 est.

One steel derrick boat for International Petroleum Co., Montreal; 70x30x6 ft.

NASHVILLE BRIDGE COMPANY,

Nashville, Tenn.

Purchasing Agent, Leo. E. Wege.

Hull 108, dredge, McWilliam Dredging Co., clam shell bucket type; 110'x51'6"x8'; steam eng.; keel July 10/27; **launched and delivered Sept. 1/27.**

Hulls 124-127 inc., four deck barges for stock; 130x32x8ft.; keels July 25/27; Aug. 5/27; Aug. 15/27; launched Aug. 23/27.

Hull 128, steel steamboat hull for Big Rock Stone Co.; 96 L.B.P.; 24 beam; 4 loaded draft; keel Aug. 18/27.

Hull 129, steel deck barge; 100x24x5ft.; keel Aug. 15/27.

Hull 130, same as above; keel Aug. 15/27.

Hull 132, deck barge, for stock; 100 L.B.P.; 24 beam; 5 loaded draft; keel Aug. 25/27.

Hull 133, deck barge for stock; 160x39x 7 ft.; keel Nov. 15/27 est.; launch Dec. 15/27 est.

Hull 134, deck barge, for stock; 100x 24x5 ft.; keel Oct. 15/27 est.; launch Dec. 1/27 est.

Hull 135, deck barge for stock; 100x24x 5ft.; keel Oct. 25/27 est.; launch Dec. 10/27 est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

California, hull 315, 18-knot, passenger liner for Panama Pacific Line, New York; 600 ft. long, 80 ft. beam, 52 ft. depth; water tube boilers for oil burning, 22,000 gro. tons; 17,000 I.H.P.; keel Mar. 20/26; launched Oct. 1/27.

Hull 321, barge for Merritt, Chapman and Scott Corp.; 154x50x13 ft.; **launched and delivered Sept. 9/27.**

Not named, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; deliver June 13/30 est. .

Not named, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement; deliver Mar. 13/31 est.

Not named, hull 325, bay steamer for Chesapeake Steamship Co.; 277' long, 53' beam, 18' depth; 2700 I.H.P.; 4-cyl. T. E. eng.; coal burning Scotch boilers; **keel Sept 28/27.**

Not named, hull 326, 18-knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Nov./27 est.

THE PUSEY & JONES CORP.,

Wilmington, Del.

Purchasing Agent: James Bradford.

Savarona, hull 1034, steel twin-screw diesel yacht for Richard Cadwalader, Jr., Philadelphia; Henry J. Gielow, Inc., naval architect, New York; 294′ L.O.A.; 38′3″ beam; 16′ loaded draft; 2 Bessemer diesel engs.; total of 3000 H.P.; keel Apr. 1/27; **launched Sept. 12/27;** deliver Jan. 1/28 est.

Not named, hull 1035, night passenger and freight vessel for Baltimore Steam Packet Co., Baltimore, Md.; 320 L.B.P.; 56′6″ beam; 15′6″ loaded draft aft; 18½ mi. speed; 1784 gross tons; 2600 I.H.P., 4-cyl. triple expansion engs.; 4 Scotch boilers, 13′8″ diameter; **keel Sept. 20/27.**

Not named, hull 1036, steel twin screw diesel yacht for Samuel A. Salvage, New York; 150 L.O.A.; 139′9″ L.W.L.; 22 beam; 7′6″ loaded draft; 18 miles speed; 246 D.W.T.; 2 Winton diesel engines; 600 H.P. each; keel Oct. 15/27 est.; launch Jan. 15/28 est.; deliver May 1/28 est.

SUN SHIPBUILDING COMPANY

Chester, Penn.

Purchasing Agent: H. W. Scott.

Axtell J. Byles, hull 104, single screw bulk oil steamer for Tidewater Oil Co.; 480′ long; 65′9″ beam, 37 feet depth, to carry 13,000 tons on 27′6″ draft; speed 11½ knots; keel March 1/27; launched June 11/27; **delivered Sept. 18/27.**

Not named, hull 106, motor tanker for Sun Oil Co.; 480′ x 65′9″ x 37′; 13,000 D.W.T.; 2800 S.H.P. at 80 R. P. M.; 4 cyl., 2-cycle Sun Doxford engs.; keel May 2/27; launch Oct. 15/27 est.; deliver Dec. 15/27 est.

Not named, hull 107, tanker for California Petroleum Co.; 510′x70′x40′; 17,000 D.W.T.; 4500 S.H.P. at 82 R.P.M., 8-cyl., 2-cycle Sun-Doxford eng.; keel July 5/27; launch Dec. 17/27; deliver Feb. 10/27 est.

Hull 108, carfloat for Pennsylvania Railroad; 330′x38′x10′6″; keel June 30/27; launch Oct. 20/27 est.

Hull 109, same as above; keel June 30/27; deliver Nov. 29/27 est.

TODD DRYDOCK, ENGINEERING, & REPAIR CORP.

Brooklyn, N. Y.

Purchasing Agent: H. J. Shannon.

Greenwich Village, hull 40, diesel-electric ferryboat for Dept. of Plant & Structures, City of New York; 101 ft. 6 in. length over guards; 27 ft. 7 in. beam; 6 ft. 8¾ in. loaded draft; 300 I.H.P. Nelseco diesel engine; keel Apr. 14/27; launched July 19/27.

Mott Haven, hull 41, diesel-electric ferryboat, sister to above; keel Apr. 14/27; launched July 19/27.

THE CHARLES WARD ENGINEERING WORKS

Charleston, W. Va.

Purchasing Agent: E. T. Jones.

F. H. Hilliard, hull 62, diesel powered stern wheel survey boat for Mississippi River Comm., Dredging Dist., Memphis, Tenn.; 139′6″x24′x5′3″; keel June 2/27; launched Sept. 19/27; deliver Nov. 7/27 est.

Not named, hull 63, steel hull diesel-electric stern wheel towboat for U.S. Engineers, St. Louis; 110x23x5 ft.; Lombard, 300 B.H.P., 400 R.P.M. eng.; General Electric motors and equipment; **keel Sept. 22/27.**

Above is a view of the steamship California immediately after launching October 1 at the plant of the Newport News Shipbuilding & Drydock Co.

General Humphreys, hull 64, steel hull inspection boat for U. S. Engineers, New Orleans; 85x18x7ft.; diesel eng.; single screw.

Repairs

BETHLEHEM SHIPBUILDING CORP., Limited

Union Plant.

Drydock, paint, misc. repairs: Point Bonita, Charlie Watson, Union Oil Barge 1922, dredge Golden Gate, schr. Esther Johnson (one new I.P. piston), President McKinley, Betterton, tug Morgan Shell, stmr. Ventura, m.s. Alaska Standard, Knute Nelson, Marie Bakke, stmr. S. C. T. Dodd, garbage boat Tahoe, schrs. Johan Poulsen, Point Loma, Claremont, stmr. Pasadena, Horace X. Baxter, Prentiss, Pan American Barges No. 1 and No. 2. Propeller repairs: Sonoma, Frank H. Buck, ferry Fresno (also dry dock and paint), Admiral Benson, President McKinley, Bandon (also 1 forged steel tail shaft), Prentiss. Repairs to shell plates: West Faralon. Piston repairs: Mahukona, Esther Johnson, Makaweli, Invincible. Drydocked for survey: schr. Brookings. Telemotor repairs: Chiloil. Misc. repairs: Makura, Mongolia, West Henshaw, Waiotapu, Chamlee, Kewanee, Moctuzuma, Steel Scientist, Wilhelmina, Lurline, Richlube, Waihemo, Hauraki, Geisha, tug F. A. Douty, stmrs. Washington, Point Lobos, Makiki, Emma H. Coppage, Point Judith, Tahiti, Willapa, West Calera, J. B. Stetson, Camden, San Ugon, Tascalusa, Cape St. Agnes, Cubore, Emidio, Japan Arrow, Charles Pratt, Skagness, San Pedro, San Fabian, San Gerardo, tug Woodman, stmrs Satanta, Tahchee, Granlund, Calawaii, Omphale.

CHARLESTON DRY DOCK AND MACHINERY CO.,

Charleston, S. C.

Docked for seasonable repairs, painting, etc.: U.S. cutter Modoc. Drydock, fire damage repairs, plates renewed on the side: stmr. Oakman. Docked for new plates in bottom: tender Mangrove.

COLLINGWOOD SHIPYARDS, LTD.,

Collingwood, Ont.

Tail shaft drawn for examination, stern bearing relined: tug G. R. Gray (46 ft. of new keel), stmr. Maplecourt.

GENERAL ENGINEERING & DRY DOCK CO.,

Alameda, Calif.

Drydock, clean, paint, misc. repairs: Petaluma, Barbara C, Centralia, Corinot (general repairs to engine and deck depts.), Standard Oil Barge No. 8, Marsodak, Admiral Schley, Edna, Northern Light, ferry Golden Bear, Shasta (also tail shaft repairs), Fort Armstrong (new booms, boom rests), m. cruiser Iris A, Idaho (put on new wheel, remove stern bearing, misc. caulking). Donkey engine repairs, work on bow chocks: Wilmington. Minor repairs: Brooklyn, Svea. General repairs: Meton. Vessels mentioned last month still undergoing repairs: stmrs. Phyllis, Stanwood, El Capitan.

THE MOORE DRY DOCK CO.,

Oakland, Calif.

Drydock, clean, paint: cutter Bear, Esther Dollar (also misc. repairs), Paul Shoup (also misc. hull, rudder, engine, and deck repairs). Drydock, clean, paint, misc. repairs: Suwied, Plow City, tug Sea Lion, Makiki (also misc. hull repairs), ferryboats San Leandro, Peralta. Drydock, hull, engine, and deck repairs: Plume. Misc. engine and deck repairs: Lurline, Sonoma, Solano (also boiler repairs). Caulked deck: Paul Shoup. Misc. boiler repairs: Frances. Misc. hull, engine, boiler and voyage repairs: Tacoma. Misc. repairs: Oakbank, Pulpit Point, Panaman (deck), Francis, Craftsman, Hercules, Meton, Los Alamos, Westport, Monterey.

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Prince Rupert, B. C.

Dock, clean, paint, misc. hull and machinery repairs to 19 fishing boats. Dock and repair hull of one scow. Misc. hull and engine repairs to 32 fishing boats. 81 other commercial jobs.

TODD DRY DOCKS, Inc.,

Seattle, Wash.

General rebuilding of ship: stmr. Comfort. Drydock, misc. repairs: Condor, Redwood (also clean and paint). Engine repairs: West Camargo, Admiral Farragut. General repairs and drydock: Julia Luckenbach. Grounding damage repairs: Admiral Watson. Misc. repairs: Admiral Farrugut, President Jefferson, S. A. Perkins, ferry Seattle.

U. S. NAVY YARD,

Bremerton, Wash.

Drydock, misc. repairs: West Virginia, Idaho, Kanawha, McCawley, Henshaw, Melvin, Percival, Zeilin. Misc. repairs incidental to operation as district craft: Mahopac, Swallow, Challenge, Pawtucket, Sotoyomo, Tatnuck.

VICTORIA MACHINERY DEPOT CO., LTD.,

Victoria, B. C.

Make and install new tail shaft: Charmer. Dock, clean, paint, cut out and renew damaged plates and frames in hull: Princess Maquinna. Dock, clean, paint, hull and engine repairs: Otter. Boiler repairs: Burrard Chief, Estevan. Take out port turbine engine and replace with new one: Princess Patricia.

The Yachts of St. Francis

Part of the fleet homeward bound

A NEW era in San Francisco Bay yachting had its commencement Sunday, October 16, when the St. Francis Yacht Club staged its initial and final cruise of the 1927 season. Twenty-one yachts and power boats took part in the cruise, carrying aboard more than 300 yachtsmen and their guests.

Led by Commodore "Jake" Punnett in his big ketch Dolphin, the St. Francis yachtsmen paraded along the San Francisco waterfront from Yacht Harbor to the Ferry Building, coming about and doubling back over the same course and then nosing out to the heads, where a new course was set to Hugo D. Keil's Marin shore estate, "Snug Harbor." As the squadron of yachts proceeded on its way it was greeted by siren blasts from other bay craft and, as it passed the Corinthian Clubhouse at Belvedere, it was acclaimed with a salvo of cannon salutes.

Lunch on the beach.

At "Snug Harbor" the yachts dropped anchor and the yachtsmen and their guests were taken ashore in small boats to sit down to an elaborate beach luncheon, one of the chief features of which was an old time yachtsmen's chowder. Two hundred and twenty people sat down at the long table to partake of the luncheon, while they were entertained with a program of music and entertainment.

At anchor off Belvedere.

Following the beach "feed" the members of the party again boarded the yachts and anchor was weighed for a short cruise about the bay before the fleet returned to the yacht harbor.

This cruise, while marking the wind-up of the actual yachting season, inaugurates a fall and winter of feverish activity for the St. Francis Yacht Club. Membership and building committees are actively at work and the club members will be on the go until the opening of the 1928 season, plans for which already are under discussion.

The outstanding event of the near future will be the breaking of ground on December 1 for the new clubhouse on San Francisco's new municipal yacht harbor. Plans for the structure, which is to cost $250,000, already are completed and it only remains for the yacht harbor dredging and grading of the bulkheads to be finished before the actual construction can commence.

The St. Francis Yacht Club is unique among bay yachting organizations. It was founded on an ideal—that of "selling" San Francisco Bay to the yachting fraternity of America. Neither money nor effort will be spared by the St. Francis members in the accomplishment of this ideal, and with a flying start behind them they are already well on their way to success.

Who's Who afloat and ashore

Edited by Jerry Scanlon

Steamship City of Honolulu

ABOARD the Los Angeles Steamship Company's liner City of Honolulu in San Francisco on October 18, a luncheon was tendered by the company to the most representative body of leading civic officials, business and professional leaders that has ever been brought together at the port of San Francisco.

Three hundred persons attended the luncheon aboard the palatial liner which operates between Los Angeles Harbor and Honolulu. The event was staged by **Ralph J. Chandler,** vice-president and general manager of the **Los Angeles Steamship Company,** as a "good will" luncheon of northern and southern California's outstanding men in all walks of life.

Headed by Mayor George E. Cryer of Los Angeles, the delegation, composed of the entire board of supervisors, the city council, port officials, chamber of commerce leaders of cities and towns of southern California, and United States treasury departmnt heads, the party arrived aboard the City of Honolulu and was greeted by San Francisco and Eastbay leaders.

The City of Honolulu was sent to San Francisco for a single round voyage while the liner Harvard was in dry-dock.

This luncheon was the largest ever held aboard a steamship in a Pacific Coast port, and was declared to be one of the outstanding gatherings ever attending a luncheon in California. In short five-minute talks that breathed the spirit of cooperation for the entire state, President Phillip Fay of the San Francisco Chamber of Commerce and George L. Eastman, first vice-president of the Los Angeles Chamber of Commerce, urged all present to work for all California. General Sherman and Ralph J. Chandler of the Los Angeles Steamship Company were lauded by the entire party for their foresight in arranging the luncheon.

Charles L. Wheeler, Vice President and General Manager of the **McCormick Steamship Company,** returned to San Francisco October 17 after a rather extensive trip to the Atlantic Coast.

Mr. Wheeler had several interesting remarks to make concerning general conditions. He stated, "I can't see any reason but what a spirit of optimism should prevail generally concerning business conditions as a whole. My reasons for thinking this are that the construction records for the first eight months of 1927 have been equal to the record year of 1926. Another thing—the income from agricultural products throughout the United States has been estimated to exceed over twelve billions of dollars, which sets a new high mark for this country. Commodity prices in general have become firmer, and the stock market only indicates 'clear weather ahead.' Money is considered 'easy' and our government finances are in the best condition they have been for ten years. No one seems to be worrying about the usual election bogy."

"One gains the impression," said Mr. Wheeler, "in visiting Washington or other places in the East that this session of Congress will see some enactment of legislation favorable to the American merchant marine. Nearly every publication or writer discussing legislation in general brings out the point that there will undoubtedly be some favorable merchant marine legislation."

When questioned as to the new Intercoastal Conference, Mr. Wheeler commented, "While some

Luncheon guests aboard the steamship City of Honolulu at San Francisco, October 18, 1927

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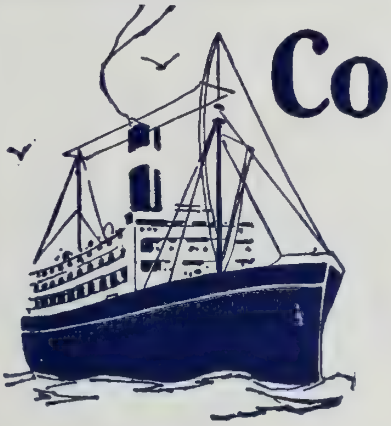

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†S S. Venezuela	Dec. 17	Dec. 19	†S S. Ecuador	Dec. 3	Dec. 13
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problems have come up in working out the new Intercoastal Conference program, I found everyone optimistic about it and enthusiastic as to its success."

Mr. Wheeler spent considerable time conferring with Middle Western officials of the Redwood Line in St. Louis and Chicago, and with Munson Line officials in the East. As a result of conferences with the Argentine government representatives in Washington, much more satisfactory discharging facilities will be provided for the vessels of the company's Pacific-Argentine-Brazil Line at Buenos Aires and other Argentine ports.

The new **Panama Pacific** liner **California** was launched on October 1 at Newport News, with appropriate ceremonies. The giant carrier will sail from New York on her maiden voyage January 28, 1928, for Los Angeles and San Francisco in regular service. Captain H. A. T. Candy, formerly master of the Mongolia, will command the ship, and Chief Engineer Edwin Prince, formerly on the Mongolia, will have charge of the giant liner's engine room.

Daulton Mann, general manager of the **Panama Mail Line,** sailed aboard the company's liner, Venezuela, accompanied by Mrs. Mann, to inspect all of the offices and agencies of the line in the Spanish Americas. Mann expects to be away two months, arriving home just before the Christmas holidays.

Steamship California, as painted by William B. Studley, second officer of the steamship Manchuria

Jack Rooney, formerly chief steward on the Panama Mail liner Venezuela, is now shore-side awaiting another ship.

Oscar DeLaude was succeeded as freight clerk aboard the Venezuela by George "Jeff" Cleighorn. DeLaude will be assigned to another vessel of the Panama Mail fleet.

When the motorship **Tisnaren,** flying the Swedish flag and the flagship of the **Transatlantic Steamship Company** returns to San Francisco the deciding game of chess to decide the championship between **Captain A. R. Hunter,** port captain of the General Steamship Corporation, agents for the Transatlantic Steamship Company, and **Captain Bertil Lilliestierna** of the Tisnaren will be played.

Captain A. R. Hunter, port captain at San Francisco for the General Steamship Corporation, at left, and Captain Bertil Lilliestierna of the motorship Tisnaren, and "Melbourne."

Two games have already been played, each captain winning one. The rules of the game as agreed between the two skippers is one game a voyage, and the Tisnaren only arrives in port every three months.

Captain Lilliestierna is a count, being a member of one of the oldest families in Sweden, but he will not permit the title to be used. The captain is one of the most popular skippers coming to the port of San Francisco. His constant companion is "Melbourne," a beautiful wire-haired setter. "Melbourne" always keeps a "weather-eye" out when the ship is arriving and departing port.

An important announcement regarding the inauguration of the new **United Fruit Company's** freight and passenger service from San Francisco to Central America and the East Coast, states that six liners will be placed on the run and the schedule is expected to be put into force some time this month. The steel framework of the new terminal on the channel between Third and Fourth streets is practically completed and state dredges are deepening the waterway. J. S. Ryder will head the company's San Francisco offices.

En route to Genoa, Italy, **J. N. MacGowan,** European passenger agent of the **Dollar Line,** is returning to his post after a business trip to this country which lasted four months and brought him into practically every large city in the United States.

A powerful searchlight will hereafter mark the boundary between Canada and Alaska in order that night fishermen will know in whose waters they are fishing. This is the result of an agreement just concluded between the two nations. This action was taken because the regulations governing salmon fishing in American waters are slightly different from those enforced by the Canadians.

Colonel E. Lester Jones, director of the United States Coast and Geodetic Survey, and member of the United States-Canada international boundary commission, has returned to headquarters after an inspection tour of survey work completed on the Pacific and in Alaskan waters.

Victor A. Link, who holds the record as being the oldest engineer in point of service aboard the Panama-Pacific liner Manchuria, was elevated from first assistant engineer to master of the propulsion department of the liner, while Chief Engineer **Edwin Bence** was on a vacation. Chief Engineer Bence is due back on the job the end of this month.

Chief Engineer Link was related to the late General Sutter and he has a valuable collection of heirlooms that formerly belonged to General Sutter. Link's father was the first American Consul sent to Mexico. There are few engineers more popular than Chief Engineer Link. He served for many years with the old Pacific Mail Steamship Company.

Noted art critics who have just viewed a painting of the **Panama-Pacific's** new liner **California** from the brush of **William B. Studley,** young second officer aboard the liner Manchuria, state that Studley's work is a masterpiece and that the young seagoing artist's work is bound to place him in the forefront of American marine artists.

William B. Studley, second officer on the steamship Manchuria.

The painting was done by Studley during his off-time watches while aboard the Manchuria. The painting is to be hung in a commanding place aboard the new liner California. Studley has never taken a drawing lesson in his life, according to his friends, but his work of marine subjects, especially his water effects have won wide recognition among Eastern art critics.

An extra ship, the Arrow Line **Hannawa,** has been necessitated for the heavy movement of canned goods to the East Coast by the **American Hawaiian Steamship Company.** This heavy offering of California, Oregon, and Washington products will continue well into the month of January, officials of the company say, and they expect it to continue with only a slight edging off, possibly until the end of February. It is at its peak right now and both canned goods and dried fruits are holding up better than usual, coast shippers declare. The European market shows a slight falling off, owing to bumper crops in the old country, but the effect has not been felt here because of the development of new markets.

Assistant chief Victor A. Link of the Manchuria

The fiscal year of 1927 showed a drop of over 661,817 tons to and from the west coast of South America, according to the official statistics just released by experts of the Canal Commission. Nitrate shipments from Chile dropping off are responsible, the statement declared, but added that it is probable that the low point in this particular commodity has been passed.

A recent ruling made by the Compensation Commission says that employees engaged by steamship companies to serve as deckhands in loading or unloading freight at ports of call and paid by the hour when doing such work are members of the crew and as such are excluded from the provisions of the workmen's compensation act.

U. S. S. Pueblo, old armored cruiser formerly known as the Colorado, has just gone out of commission. The vessel was well known on the Pacific and was very active in troop convoy duty during the war. The hospital ship **Mercy** has been placed in full commission, beginning December 1, and will serve in train squadron one of the fleet base force.

Honolulu and San Francisco will be brought thirty-six hours closer when the **Matson** liner **Malolo** inaugurates the fast service of four days between the Islands and San Francisco, starting November 16.

The Malolo (Flying Fish) is due in Los Angeles harbor on November 10, and will arrive in San Francisco the following day. Coming from New York on the Malolo will be **President William P. Roth, Chairman E. D. Tenney** of the board of directors, **Vice-President A. C. Diericx,** and **William H. Sellander,** general passenger manager of the Matson Navigation Company.

Commodore Peter Johnson will be on the bridge of the vessel. A luncheon at Los Angeles and San Francisco will be tendereed by the Matson Navigation Company to a gathering of representative civic, business, and professional men and women in both cities.

The Malolo sailed from New York October 27. She will make the 2200 mile voyage from San Francisco to Honolulu, leaving November 16 on her maiden voyage in the service. Her schedule calls for the fast time of four days. She will have accommodations for 650 passengers. However, on her maiden voyage her speed will be reduced to bring her into Honolulu harbor on Monday morning instead of Sunday morning, officials of the company announced to fit in with the gala celebration that has been arranged for the new liner.

The San Francisco steamship dinner, the annual high jinks of the maritime fraternity, held on October 22, at the Hotel St. Francis, was the most successful ever staged. Every prominent shipping man in San Francisco and Oakland was present, with a number from Los Angeles, Portland, Seattle, and Tacoma also among the guests. **Hugh Gallagher,** assistant manager of the Matson Navigation Company, was commodore of the arrangements.

Matson's new port accessories building at San Francisco is now in operation, serving the entire fleet.

At Bryant and Main streets, within one block of the company docks, it has already proved its usefulness. It was designed and built to expedite the fitting out of Matson ships, particularly those carrying passengers, to shorten the turn around, and to standardize and improve the service. This building is filling a long felt need of the company.

The entire top floor houses a modern laundry, handling linen from the entire fleet of twenty-three vessels, including the Malolo, which will be added to the service this month. Perfect sanitation and the highest grade of workmanship are assured, as the linen and blankets never leave the company's possession and are cleaned by the latest methods, insuring longer life. Purchasing, storeroom, commissary activities take up other space in the building. Purchase in bulk is now practical, as the predelivery of all vessel needs at this building permits minute inspection, exhaustive tests for quality, and the making of complete preparation for use on vessels of the fleet. In the commissary department there are fourteen refrigerated rooms of various capacities and temperatures to suit the requirements for meats, vegetables, fruits, poultry, ice cream, and other perishable goods necessary for the cuisine on a modern passenger liner.

The building, as a warehouse, is far ahead of any other of this type and is a leader in buildings of this character. The storage of fire brick, of fire clay, of spare parts for vessels and their machinery, and of all obsolete material pending its disposal will be provided for on the adjoining property on Main street. This propery will also provide automobile parking space.

New Matson warehouse at San Francisco

During a visit to San Pedro, **Captain Walter J. Peterson,** general manager of the **Marine Service Bureau** of the Pacific Coast, stated to shipping officials the prediction that unless some form of aid was given, the American merchant marine would disappear from the seas within a few years. He said the American operators were faced by a 31 per cent higher overhead expense as soon as a new vessel's keel hit the water, 24 per cent of this being represented in the cost of construction and the remaining 7 per cent by the higher operating cost over that of other countries.

"American shipping men and operators are awakening to the need of government recognition of the industry by some other means than through the shipping board, which in many cases operates ships in competition to private owners," Captain Peterson added.

Pat Doheny is the name selected for the Sunoco, second large tanker purchased by E. L. Doheny's **Petroleum Securities Corporation.** The vessel will be renamed in Los Angeles harbor with appropriate ceremonies. The Sunoco was purchased from the Belgian Societi anonamie de Gaz.

Chief Engineer Ferris J. Cordall of the freighter **Maunalei** is again "on deck" after being confined to a hospital for several weeks for an overhauling to remove his tonsils. Never again, reported the genial chief, as soon as he was able to talk.

After serving continuously for fifty-one years Engineer Captain **W. J. Willett Bruce, O.B.E.,** chief superintendent engineer of the **White Star Line,** resigned the first of November. Captain Bruce, as he is known, started fifty-one years ago in the White Star shops in Liverpool. His first sea service was aboard the old Baltic as sixth engineer. Captain Bruce is one of the best known engineers in the British merchant marine, and has a host of friends among steamship men and engineers on the Pacific.

The regular monthly meeting of the Oakland Traffic Club was held at the Athens Club on Tuesday evening, October 18, at which time about fifty men were present including members and visitors. The president announced that some ten or twelve new members had been taken in and that the organization was at last going along in fine shape.

Mr. Wilcox, traffic manager for the Oakland Chamber of Commerce, gave a very interesting lecture on the procedure in placing dockets before the Interstate Commerce Commission. H. M. Wade, practising attorney before the Railroad and Interstate Commerce Commission, discussed the dockets placed before both bodies.

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The Admiral liners **Dorothy Alexander** and the **Admiral Farragut** are now running in the Pacific Coast service after having been operated in the Alaskan service all summer. The two vessels are handling the trade of the greyhound, H. F. Alexander, during the lay-up of the flagship for overhauling.

A ship his home, his neighborhood the world. That, in brief, is a short story of **John Robertson,** chief steward of the Dollar liner **President Lincoln,** who for the past thirty years has presided over the culinary departments of liners of various nationally famous steamship lines. That he has done so with success is easily attested to by the high esteem in which he is held by globe trotters, business men, missionaries, the highest army and navy officials, and the merchants of the Far East.

Born in the quaint old town of Paisley, Scotland, "Jock," as he is familiarly known in all ports of the world, left home at an early age for New York City. His talent as an accountant and clerk landed him a position with the army transport service and it was only a few years until he became chief commissary clerk of the old transport Kilpatrick, carrying troops to Cuba, Porto Rico, and the Philippines. He handled his job so successfully that he can now exhibit letters of thanks, recommendations, and other documents attesting to his ability as to the handling of officers' messes, troop messes, government accounts, and all the duties that go to make a successful chief commissary steward.

John Robertson never forgets the faces of friends. Only a few trips ago when the rush of the marines to Shanghai necessitated many of the higher officers taking passage on his vessel, his brother officers had an insight into this laudable ability. At Shanghai a grayhaired old Colonel came aboard the ship, wearing the campaign badges of Nicaragua, the occupation of Vera Cruz, Spanish-American War, Philippine Insurrection, the World War, and decorations for bravery. He was greeted by Chief Steward Robertson, but for a moment could not recall "Jock" until he was informed of the fact that he was a passenger on the old transport Kilpatrick in '98 to the Philippines as a second lieutenant of marines, and then he remembered the acquaintanceship of those years before, when, as a junior officer fresh from the Naval Academy, he had learned from the Chief Steward quite a few things an officer going to a new station likes to know.

John Robertson, chief steward on the steamship President Lincoln

Robertson has had great success with the Dollar Company, and his record for efficiency is well known. He has served on vessels of the Pacific Mail, the old Toyo Kisen Kaisha, the Peninsula and Oriental line, the Munson line, and in the Army Transport service on both coasts. His experiences well qualify him to join the writing fraternity and tell us about his thirty years as a chief steward.

That the new liner Malolo is certainly going to create a sensation when she arrives in San Francisco, is the gist of a letter received from **Harold de Golia,** assistant general passenger agent for the Matson Line of their South Seas and Australian service. De Golia was shown over the new vessel by **H. E. Pippin,** Matson's New York agent, and the purser of the vessel, **H. W. D. McKenzie.**

"The public rooms are very fine and the nice feature is that they are grouped together on one deck. The staterooms are very attractive and are all of a good size. Even the inside rooms are beautifully fitted up and are fine and large," he writes.

The second oldest skipper in point of service of the Matson Line, **Captain J. O. Youngren,** has been retired on a pension. He commanded one vessel, the old steamer Enterprise, for a quarter of a century, a remarkable record. Captain Youngren celebrated his sixty-ninth birthday on September 23. Born in Sweden, he came to the United States at the age of ten, arriving in San Francisco in 1878 from Boston, and has been a master of steam vessels since 1881. **Captain Thomas Murray,** former master of the Mana, has taken Youngren's berth on the Enterprise. **Captain G. G. Wait** succeeded Murray.

A new Dollar schedule has just gone into effect. All passenger ships of the line, 'round-the-world and transpacific, will sail from San Francisco on Fridays at 4 p. m., instead of Saturdays, as heretofore. The first vessel to sail under the new schedule was the 'round-the-world liner President Polk.

The transatlantic liners President Harding and President Roosevelt will be diverted from their regular schedules during the first three months of 1928 to make Mediterranean cruises, it was announced by M. H. Hunt, passenger manager of the United States Lines at San Francisco. Travel is light to Cherbourg and Liverpool, and after a study of the situation officials of this line decided on the change.

P. A. S. Franklin, president of the International Mercantile Marine Corporation, made some pertinent remarks bearing on the American merchant marine at the launching of the California for the New York-San Francisco service recently. He said:

"There is a profit in shipping under the American flag if one may trust in the evidence of the liner California, built for the Panama Pacific intercoastal service, an I. M. M. subsidiary, or her sister ship which will shortly take her shape on the ways of the shipyards.

"The I. M. M. is very anxious to get back into the North Atlantic trade under the American flag, but to accomplish this we must receive substantial assistance from the government in order to compete with foreign flag shipping concerns."

The narcotic smuggling situation has become so acute that government officials, in cooperation with officials of companies operating

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vessels in the trade to the Orient, recently held a meeting to devise new ways and means to fight the menace. One solution of the problem determined upon and now actually in force is the placing of searchers and guards on Dollar liners on the side trip from San Francisco to Los Angeles and return. Recommendations for better pay for customs guards, inspectors, and officers will be made to Congress shortly it is believed. No one particular line has been singled out, the officials state, regarding the narcotic menace, but they declare that suspicion naturally attaches to vessels on the regular trade routes to the Far East.

For a reconditioning and overhauling, the "greyhound of the Pacific," the **H. F. Alexander** of the Pacific Steamship Company, will be in San Francisco during the winter months. This is a distinct gain for San Francisco shipyards and workers as the usual custom has been to lay the big ship up at one of the northern yards. She will anchor in the stream following repairs, most of which will be made on her port astern turbine.

The oldest port engineer in point of service along the San Francisco waterfront, **Joe Barker,** of the Matson Line, was recently presented with a sterling silver medal, appropriately engraved, by his many friends. A parchment scroll, setting out his services in the Matson company was also presented to him.

Henry F. Gelhaus, superintending engineer for Swayne & Hoyt, lifelong friend of Barker's, made the address of presentation at Pier 32, where the ceremonies were held. Among those present were **Captain C. W. Saunders,** manager of operations for the Matson Navigation Company; **Captain F. M. Edwards,** general superintendent; **Robert E. Christy** and **William McDonald** of the United Engineerng Company, and **Dan Sutherland** of the United Ship Repair Company.

Oakland's new Fourteenth Street Pier, on the western waterfront, has just been completed and is now in operation, and **G. B. Hegardt, port** manager, together with the Board of Port Commissioners, received the plaudits of leading citizens at the ceremonies held when the new pier was opened for business.

The Grove Street Pier, now in the course of construction, will be opened shortly after the first of the year, officials report. More than ninety-eight per cent of the work on the superstructure has been completed, and more than half of the steel frame for the pier sheds has been installed. The concrete sides and the walls for the double pier are being installed by the Clinton Construction Company. Wiring, paving and the sprinkling system will be the only uncompleted items by January 1, Hegardt states in his last report.

In the Brooklyn basin off Government Island in the estuary, dredging operations by the U. S. Government to give the north channel a depth of 23 feet at low water have been completed. The work was done at a cost of $120,000 and was part of the extensive dredging program authorized for Oakland by the War Department. Port statistics, according to Hegardt, show a considerable gain over figures of last year.

Captain A. A. Sawyer, master of the Los Angeles Steamship Company's liner Calawaii, on the Honolulu run, is one of the most popular masters in the company's service. He is especially popular with all the children who travel aboard his ship from Los Angeles to Honolulu and is known as the "children's captain." Captain Sawyer is widely known in Pacific shipping circles and is as popular with his officers and crew as he is with his passengers.

Captain A. A. Sawyer of the steamship Calawaii

Harbor officials of both San Francisco and Oakland have again warned shipmasters that severe penalties will be assessed the captain and vessel found guilty of polluting the waters of San Francisco Bay with oil laden bilge water.

Violations of this rule were brought to the attention of shipmasters, following the action of an Oakland judge in fining a San Francisco shipping firm $300 for such violation while its vessel was lying at her berth in Oakland.

Officials of the Fish and Game Commission are increasing their vigilance against such offenders. Yachtsmen also have been complaining, and local steamship officials are cooperating with harbor authorities to guard against pollution of the inland waterways and harbors.

Swayne & Hoyt of San Francisco have the chartered steamer El Capitan on the Pacific Coast as an additional carrier for their gulf service. The inclusion of the extra freighter will not interfere with their gulf service schedule.

Pacific Coast shipping interests were not surprised at the recent announcement from Washington that a special meeting of the Shipping Board had ordered the return of the Fleet Corporation to the direct management of the Board, and a reorganization which places control of government owned lines in the hands of **T. V. O'Connor,** chairman of the Board. O'Connor now holds the title as president of the Fleet Corporation and chairman of the board of directors.

William Jackson, chief engineer of the Dollar liner President Lincoln, holds a unique position in marine engineering circles and many of his friends claim possibly a record. Jackson, a native of Livermore, first started out as a railroad fireman but took to soldiering immediately thereafter and finding it not so well to his liking joined the merchant service. During the war he served in the U. S. Navy and following discharge was chosen to go East and observe the installing of engines in the vessel on which he now acts as chief. From the time the big ship has been sailing the seas, Jackson has been with her as chief. In all of her service to the Orient, both under the house flag of the old Pacific Mail and under the Dollar ensign, Jackson has never missed a watch.

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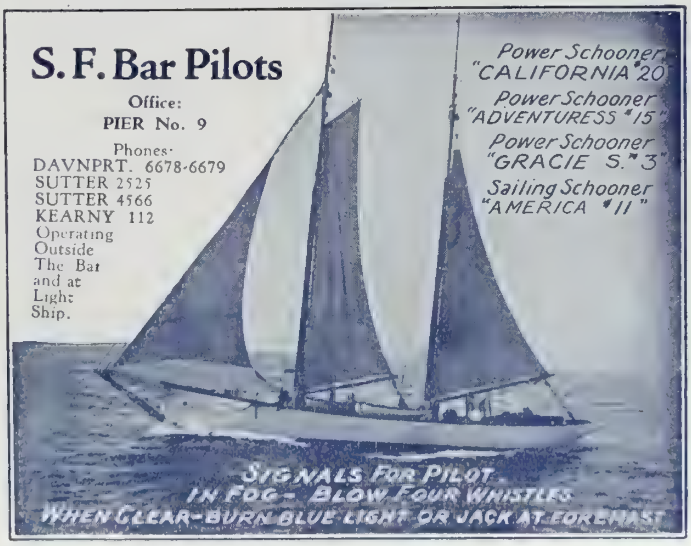

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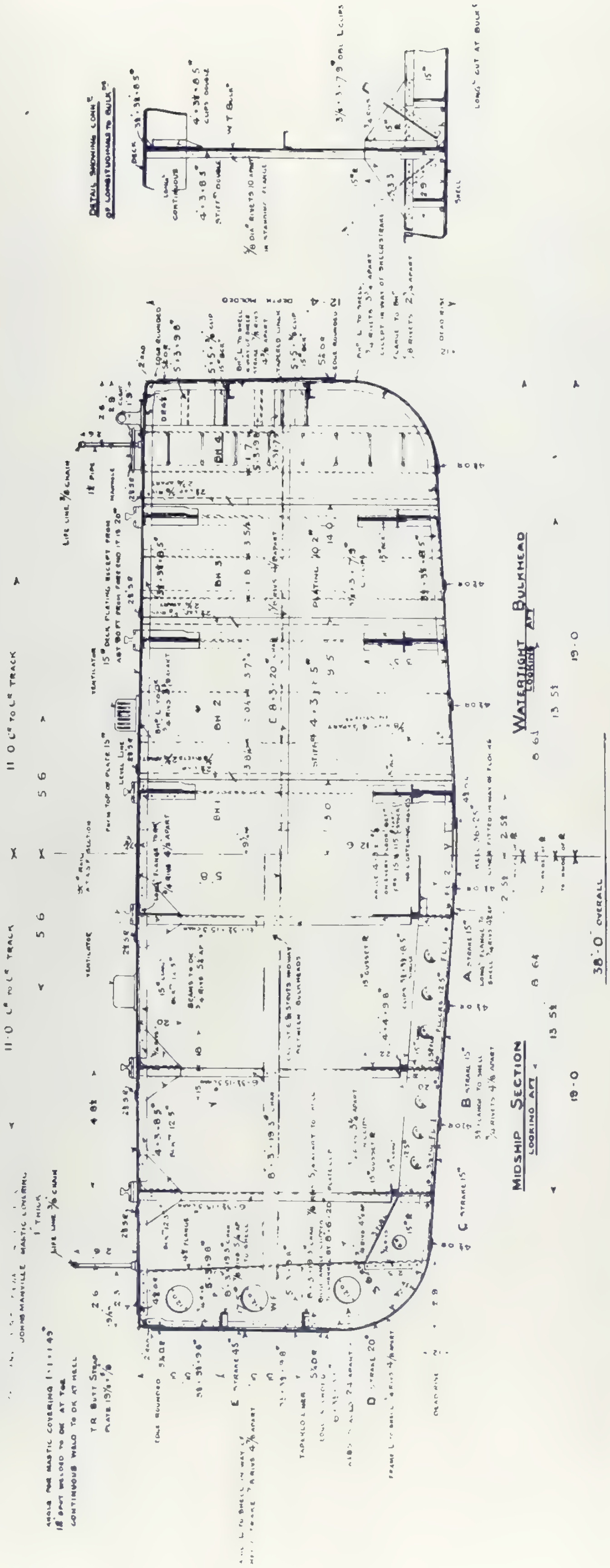
Steel Carfloats For Santa Fe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C STRAKE 15#
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E STRAKE 45#

ALL freight moved from the Santa Fe terminal yards at Richmond to San Francisco is carried on carfloats. The wooden barges used for this purpose have never been satisfactory because uneven loading causes them to hog, or sag, and in this condition they require too much expenditure of power in towing. A year or two back the Atchison, Topeka, and Santa Fe Railway ordered from The Moore Dry Dock Company a special steel carfloat for this purpose. The success of this float is now resulting in the building of additional floats along the same general lines. Competitive bidding gave the second Santa Fe car float to the Union Plant of the Bethlehem Shipbuilding Corporation.

As will be noted from the midship section reproduced herewith, the float is built much like a steel seagoing freighter. Her 12-inch dead rise on 38-foot beam adds to her stiffness and makes for easy towing. She is 260 feet long over-all and is divided into 14 water-tight compartments by 13 water-tight bulkheads.

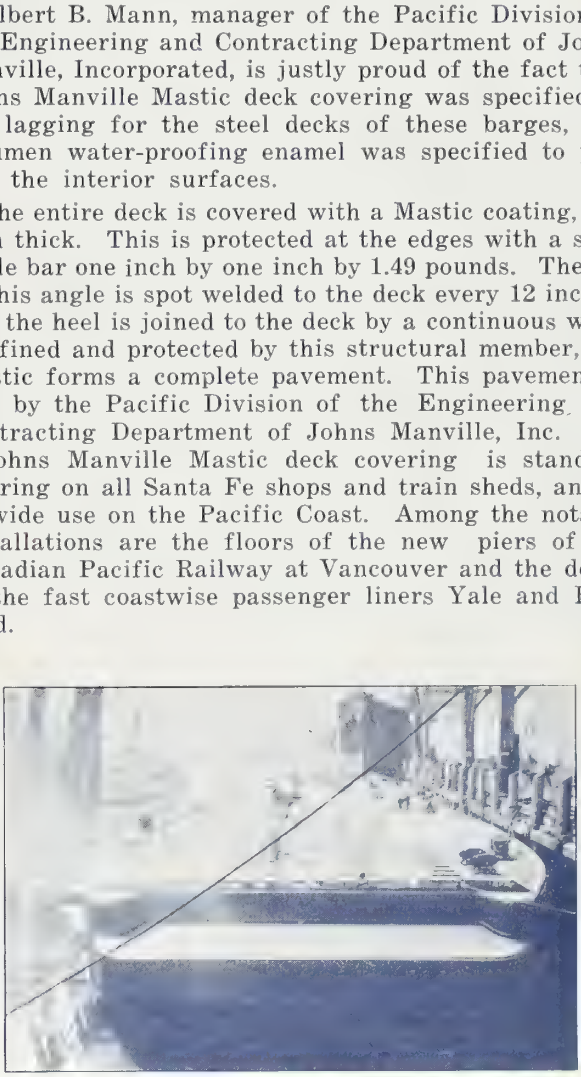
The shell of the carfloat is of 15-pound plate on the bottom strakes, 20-pound plate on the bilge strake, and 45-pound plate on the side strake.

Three tracks are fitted on the deck, and directly under each of the six rails the hull is stiffened by a longitudinal truss running the full length.

Albert B. Mann, manager of the Pacific Division of the Engineering and Contracting Department of Johns Manville, Incorporated, is justly proud of the fact that Johns Manville Mastic deck covering was specified as the lagging for the steel decks of these barges, and Bitumen water-proofing enamel was specified to protect the interior surfaces.

The entire deck is covered with a Mastic coating, one inch thick. This is protected at the edges with a steel angle bar one inch by one inch by 1.49 pounds. The toe of this angle is spot welded to the deck every 12 inches, and the heel is joined to the deck by a continuous weld. Confined and protected by this structural member, the Mastic forms a complete pavement. This pavement is laid by the Pacific Division of the Engineering and Contracting Department of Johns Manville, Inc.

Johns Manville Mastic deck covering is standard flooring on all Santa Fe shops and train sheds, and is in wide use on the Pacific Coast. Among the notable installations are the floors of the new piers of the Canadian Pacific Railway at Vancouver and the decks of the fast coastwise passenger liners Yale and Harvard.



Laying Johns Manville mastic deck covering on the Santa Fe carfloat.

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November 16 is the date set for the maiden voyage of the new de luxe Matson liner Malolo (Flying Fish) from San Francisco to Honolulu. It will be an event in the history of passenger transportation on the Pacific. At Honolulu a picturesque and colorful *aloha* pageant will be extended this great new ship, fastest, finest and largest on the Pacific. Lovely Hawaiian girls and stalwart warriors attired in tapa cloth costumes of a century ago will meet the Malolo and adorn her passengers with fragrant flower leis. It will be a welcome of welcomes; the aloha of the Hawaiians to their ship.

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A Turbine Stethoscope

Chief Engineer M. Tomita of the steamship Tohsei Maru testing turbine vibrations

FOR the same reason that a doctor puts his stethoscope over a patient's heart or lungs in order to determine his condition, M. Tomita, chief engineer of the Yamashita liner Tohsei Maru, applies a similar device to turbine frame or gear case on board his vessel.

When the human body is in good health and working properly, certain vibrations or sounds are recorded in the physician's stethoscope. For the examination of the turbines and gears of the Tohsei Maru, Mr. Tomita has devised an instrument which consists of steel rods of various lengths which look somewhat like large tenpenny nails. They are pointed at one end and have mushroom-shaped heads. The point is set on the piece of machinery to be examined and the mushroom head is placed to the ear.

"With a little practice," said Mr. Tomita, "a trained engineer with this instrument can tell immediately whether his machinery is performing properly, and the only time to make any change in the machinery is when improper vibrations are recorded in this 'stethoscope.'"

Back in 1920, the Westinghouse International Company delivered to the Uraga Dock Yards Company of Japan, through their representatives, Takita & Company, a set of Westinghouse 3000-shaft horsepower cross-compound turbines and double reduction gearing together with condenser and other auxiliary equipment. This machinery was intended for a ferryboat which was never built and the apparatus was put in storage for future use.

When the Yamashita Company, which owns and operates twenty ocean-going steamers and whose circled "Y" house flag is known in every port in the world, decided to build the Tohsei Maru at the Uraga Dock Company's yard, Mr. Tomita was assigned to supervise the installation of the Westinghouse machinery which the builders had decided was to go into the vessel.

During the earthquake which rocked Japan in September, 1924, considerable damage was done about the shipyard in which the Westinghouse equipment was stored and although some of the apparatus was damaged and the plans and drawings of the equipment either destroyed or lost, Mr. Tomita reports that he, with the assistance of mechanics of the shipyard, very easily installed and operated this equipment with less time and trouble than it would take to set up the ordinary apparatus installed on the average merchant ship.

The Tohsei Maru is a vessel of 5484 gross tons. She is 400 feet long, 53 feet beam, and has a draft of 32 feet.

Allan Cunningham Busy

Allan Cunningham, Seattle, has recently manufactured some especially notable electrically operated deck machinery for installation in the Standard Oil tanker District of Columbia. These units include one large anchor windlass, four vertical capstans for warping, and two deck hoists or winches.

The shafts of stainless steel and the sliding clutches of phosphor bronze are made hexagonally, avoiding any troubles due to loose keys. The brake rods and their nuts are also of the same materials, practically preventing corrosion and sticking.

The electrical units are supplied by Westinghouse Electric and Manufacturing Company and are of a special water-tight type. The motor on the windlass is 75 horsepower, those on the winches 25 horsepower, and those on the vertical capstans 40 horsepower. These will operate on a 240-volt line and are said to be the most powerful warping engines, electrically actuated, that have ever been built for marine use in the United States.

In these units the drive shafts and worm gears are made integral from the solid forging, the driven gear being phosphor bronze. Special design of hoists prevents any possibility of ropes becoming fouled in gears, they being completely enclosed, self-lubricating, and watertight. The windlass and wildcat frames are of cast steel, and all bedplates of semi-steel; wildcats will take chain links 8 by 12 inches, of 2 5/8-inch diameter.

Allan Cunningham is also building, for the Panama Canal Commission, a fully automatically controlled electrical towing engine of 50 horsepower to handle a 1¾-inch steel towline. This machine will be installed on one of the large towboats at the Canal Zone for use in extra heavy outside towing.

At the same shop are being built the deck hoists for the new Seattle fire boat, under construction at Oakland.

Besides these jobs, Allan Cunningham is building two steam steering gears for the tugboats Crolona and Biddle, operated by the California and Hawaiian Sugar Company at Crockett, California. These boats tow heavy water barges from Sacramento River to the sugar refinery, and the steering gears have been specially designed to stand up under hard and constant usage. Crank shafts, eccentrics, and drive pinions are forged from solid ingot and machined to shape and size. No possibility of loose cranks or eccentrics here.

Port Note

Kelso, Wn. Alloway and George of Spokane, Wn., have the contract for construction of a 375,000-bushel grain elevator at Kelso to cost $371,813.

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Freights, Charters, Sales

October 18, 1927.

THE following steamers are reported fixed with grain to the U.K.-Continent; British str. City, 35/-, Dec./Jan., Wm. H. Pim, Jr.; British str. Smith, same; British str. Winkleigh, 33/6, Nov., same charterers; British str. Treneglos, 35/-, Nov., Kerr Gifford & Co.; a steamer, 33/9, Jan.; British str. Demeterton, 33/6, Dec., Strauss & Co.; British str. Great City, same; British m.s. King James, 33/6, Nov.; Swedish m.s. Lulea (or substitute), 34/6, Dec., Wilmer Grain Co.; British str. Ovington Court, Portland or Puget Sound, 34/9; Vancouver, 33/6, Dec., Heatley & Co.; (Ropner steamer), 33/9, Dec., Strauss & Co.; British str. Taransay,, Portland, Puget Sound, 34/9, Vancouver 33/6, Dec., same charterers; British str. Barclyde, 34/9, Dec., Strauss & Co.; British str. Baron Loundaun, 34/-, Nov., Wilmer Grain Co.; British str. Meropi, 34/-, Nov., Wm. H. Pim, Jr.; (Ropner steamer), 33/6, Feb., same charterers; British str. York City, 33/-, Dec. Strauss & Co.; 5 steamers, 33/6, Dec-Jan.; A steamer, North Pacific to U.K.-Continent, 33/-, 6/- less of Rotterdam or Antwerp, Nov./Dec., Strauss & Co.; British str. Lillehorn, Vancouver to Antwerp, 30/-,Oct.; British str. Reedpool (or sub.), Vancouver, 33/9, option Portland or Puget Sound, 35/-, Dec./Jan.; British str. Anglo, Vancouver to U.K.-Continent, 33/-, option Portland or Puget Sound, 34-3, Dec./Jan., Strauss & Co.; British str. Grainton, Vancouver loading, 32/-, option Portland or Puget Sound, 34/3, Dec./Jan., same charterers; British str. Wearpool, Oct./Nov.; British str. Homeside, 33/-, Jan., Strauss & Co.; British str. Illingsworth, Vancouver to Antwerp or Rotterdam, 32/6, option Puget Sound 33/9, Dec., Wm. H. Pim, Jr.; British str., Vancouver to U.K.-Continent, 33/6, option Prince Rupert 34/-, Dec./Jan.; Radcliffe str., Vancouver to U.K.-Continent, 33/3, option Prince Rupert 34/-, Dec./Jan.; British str. Benreoch, 33/-, Dec., Heatley & Co.; British str. Fishpool, Oct./Nov. loading; British str. Ilvington Court, Vancouver loading, 33/6, Dec./Jan., picked ports 6/- less; British str. Siltonhall, B.C. to Antwerp, 33/9, Jan.; a steamer, 33/3, Dec./Jan.; British str. Benmachdhui, 35/-, Nov., Kerr Gifford & Co.; British str. Tofuku Maru, 34/-, Oct.-Nov., Kerr Gifford & Co.; British str. Tre, Vancouver to U.K.-Continent, 33/-, option Antwerp or Rotterdam, 32-6, Dec., Dreyfus & Co.; British str. Bradford City, Portland, Puget Sound or Vancouver loading, Nov., Kerr Gifford & Co.; British str. Roxby, Nov.; British str. Hindustan, Vancouver to Antwerp or Rotterdam, 33/3, Dec.

The Japanese str. Meiwu Maru is reported fixed from Portland to Japan, wheat, Oct./Nov. loading.

A Japanese steamer is reported fixed with lumber from two ports North Pacific to two ports Australia, $13.50, November loading, by Pacific Export Lumber Co.

The following fixtures are reported for lumber from North Pacific to the Orient: Japanese str. Ishin Maru, Japan, $10, Oct., Canadian American Shipping Co.; Japanese str. Milan Maru, Japan, lump sum, Oct./Nov., Yamashita Co.; Japanese str. Boston Maru, Oct./Nov.; Japanese str. Woyo Maru, Shanghai, Nov.; Swedish m.s. Falsterbo, Shanghai, (recharter), Oct., Dant & Russell; Japanese str. Kohryu Maru, Japan, Nov., Canadian American Shipping Co.; Japanese str. Havre Maru, Japan, Nov., Canadian American Shipping Co.; Japanese str. Rozan Maru, Japan, Oct./Nov., Yamacho Co.

The following steamers are reported fixed with lumber from the North Pacific to the West Coast of South America: Japanese str. Kinkasan Maru, $11.75, Oct., W. L. Comyn & Co.; Japanese str. Ibukisan Maru, Dec., same charterers; Japanese str. Iwatesan Maru, Nov., same charterers.

The following lumber fixtures to the Atlantic are reported: Japanese str. Gyokoh Maru, Nov. loading; American str. Commercial Spirit, 1 berth San Francisco to New York, Philadelphia, Norfolk and Baltimore, early Nov., Swayne & Hoyt; American str., J. R. Gordon, Oct./Nov., Krauss Brothers Lumber Co.

The following tanker fixtures are reported: Norwegian m.s. Dagland, San Pedro to two ports U.K.-Continent, 26/- (London), Nov.; a steamer (clean), California to North of Hatteras, 80c, 12 months, Oct./Nov.

The British str. Robert Dollar is reported fixed from Puget Sound and British Columbia to U.K.-Continent, with lumber and wheat, by the Canadian American Shipping Co., and the Danish str. Susan Maersk from Puget Sound to Tampico, Mexico, with box shooks, by Thorndyke Shipping Co.

The following time charters are reported: Japanese m.s. Fukko Maru, Pacific trade, 12 months, delivery Japan, $1.70, less 2½ per cent., Dec./Jan. loading, by Douglas Fir Exploitation & Export Co.; British str. Buchanness, Pacific trade, 4 months, delivery Pacific, redelivery North of Hatteras, lump sum $11,200, Oct. loading.

The following sales are reported: American m.s. Challamba (will be broken up), Pacific Steamship Company to Cary-Davis Tug & Barge Co. of Seattle; Suremico (bare hull), $3500, Transmarine Lines to W.C. Nickum; American bkts Hecla, Pactolus, St. Katherine, B. P. Cheney, and American str. Lehua, Frank B. Peterson to General Metals Co. of Oakland.

PAGE BROTHERS, Brokers.

Port Construction

Richmond. H. F. Brunnier, of San Francisco, an engineer, has been retained by the City Council of Richmond to prepare plans and specifications for the new $225,000 wharf and shed project, provide a resident engineer and inspector, call for bids, and attend to other work in connection with awarding of contract for this improvement.

Los Angeles. The new high density cotton compress, with a seasonal capacity of 175,000 bales, was completed and put into operation in October by the Los Angeles Cotton Compress Company, A. H. Lamberth, president.

The San Francisco Bridge Company, of San Francisco, was low bidder at 55 cents a cubic yard, for the work of removing Deadman's Island at the entrance to Los Angeles harbor, which work is being undertaken under federal supervision and will cost approximately $1,200,000. Major P. C. Gross at San Pedro is engineer in charge.

Lynch Construction Company, Central Building, Los Angeles, has the contract for erecting a steel warehouse, 120 by 960 feet, on Berths 228 D and E. Contract for fabricating the 520 tons of structural steel was given to the Union Iron Works of Los Angeles.

Modern Cargo Cranes

(Continued from page 513)

center, of 76 feet 9 inches, and has a minimum radius of 11 feet 3 inches; that is to say, it can pick up or deposit its load anywhere between two circles having diameters of 153 feet 6 inches, and 22 feet 6 inches, and can place its load not only on the dock itself but also on upper floors of the sheds if so desired, a point in its favor, as compared with cranes illustrated in Figs. 7 and 8.

The jib with its counterweight and other parts which go to form the revolving portion of the crane are made as light as is compatible with safety, so that with a hoisting speed of 175 feet per minute for 5 tons, or 300 feet per minute for 2½ tons, and with a high slewing speed, which at the maximum is 450 feet per minute, quick action is obtained in transporting a load from one point to another.

The wheel loads indicated in the illustrations are directly comparable, as all the cranes except those shown in Figs. 5 and 6 are exactly similar as far as loads, outreach from face of dock, and speed are concerned; except also that the crane shown in Fig. 7 is designed for hoisting speeds of 100 feet per minute for 5 tons and 200 feet per minute for 2½ tons, as against 175 and 300 feet per minute, respectively, for the other cranes. This difference makes the impact component of the total wheel load slightly less for the crane in Fig. 7 than it would be if the higher hoisting speeds were used.

In Europe level-luffing cargo cranes are now almost exclusively used, and other designs than that shown in Fig. 1 have been evolved. The arrangement for obtaining the level-luffing motion in the crane shown in Fig. 2 consists of a special reaving of the hoisting rope in conjunction with a particular arrangement of the centers of the jib-head sheaves, the fixed sheaves on the superstructure, and the jib-foot pivot. The hoisting rope after passing over the sheave A at the extreme end of the jib is taken around one of the sheaves at B, thence back to one of the sheaves at C, again over a second sheave at B, and thence to the hoisting barrel E. When luffing-in the jib from one radius to another, the distance between A and B decreases by an amount equal to one-third of the vertical raise of the jib head. Since there are three falls of rope between A and B, the amount of rope paid out is three times the amount by which the distance AB has been decreased, and, therefore, compensates for the vertical rise of A.

Luffing is accomplished by means of the ropes leading from the counterweight F, around the luffing winch D, over one of the sheaves at B, thence to the jib head and back to B, where they are anchored.

It will be noted that the hoisting rope in passing over the various sheaves is being continually bent through approximately 400 degrees more angularity than in the case of the crane shown in Fig. 1. This means that the life of the hoisting rope is very much shortened, with a proportionate increase in the cost of maintenance. The counterweight F in this crane is much lighter than that of the crane in Fig. 1. To make up for this, additional ballast is placed in the back of the operating cab, so that the total is considerably in excess of that of the first crane. Also, the crane in Fig. 2 lacks the advantage gained by the outward movement of the counterweight as in Fig. 1.

In Fig. 3 is shown another design of level-luffing crane. Here the hoisting rope, after passing round a sheave near the jib foot is taken over a sheave placed concentrically with and attached to the traveling counterweight; it is then taken back to the sheave near the jib foot and so to the hoisting barrel. As the jib is luffed in, the counterweight travels down the inclined path, thus paying out the required amount of rope to give level luffing.

A somewhat novel type of crane is illustrated in Fig. 4. This is of German design, in which country it has been used quite extensively. As will be seen it is on the order of a pantograph, thus obtaining the level-luffing feature.

The two cranes shown in Figs. 5 and 6 are very similar in the means employed for obtaining the level path of travel for the hook. The hoisting rope, on its way from the jib head to the hoisting barrel, is taken in a bight round the sheave centered on the radius rod attached to the crane structure. As the jib is luffed, this sheave is made to travel along the track forming part of the jib. Except for this similarity the cranes are very different, that in Fig. 5 having the peculiarity that the lower end of the jib is so constructed that it embraces the revolving tower, and has counterweights on either side of the machinery house. Luffing is done by means of pinions engaging in the segmental racks.

TABLE 1 PRINCIPAL DATA ON CRANES ILLUSTRATED

Fig. No.	Total weight, lb.	Hoisting speed, 10,000 lb., ft. per min.	Hoisting speed, 5000 lb., ft. per min.	Slewing speed, r.p.m.	Luffing speed, horizontally, ft per min.	Maximum wheel loads, two-wheel bogies, lb.
1	127,000	175	300	1.5	200	81,800
2	149,000	175	300	1.5	200	85,000
3	195,000	175	300	1.5	200	108,500
4	146,000	175	300	1.5	200	90,000
					Racking	
8	169,200	100	200	1.0	250	97,800

In Figs. 7 and 8 are shown cranes of the transporter type, that shown in Fig. 8 having the advantages over the one in Fig. 7 in that the load may be transported to the rear of the machinery house. This is accomplished by offsetting the trolley rail from the center line of the jib by an increasing amount as the rail leaves the jib head and approaches the main structure. At the center line of rotation of the crane the trolley rail is sufficiently offset for the trolley and its load to pass the substructure. The amount of this offset determines the minimum operating radius of the crane. The type illustrated in Fig. 8, on account of the offset, approximately 17 feet, has a greater minimum radius than that in Fig. 1.

It might appear that once this type of crane had been put into position, with its jib head in the correct position over the ship's hold, a greater unloading speed could be attained than with a luffing crane, by reason of the fact that the load after being hoisted travels in a straight line to the point of discharge instead of traveling in a more or less circular path as in the latter case. It should be observed, however, that whereas the crane in Fig. 8 has a racking speed of 250 feet per minute, the slewing speed of the crane in Fig. 1 has a maximum of 450 feet per minute, and an average of 277 feet per minute.

In addition to this the level-luffing crane is almost invariably luffed at the same time that it is being slewed.

In the table are given the principal data relative to those cranes illustrated, which are designed for the same general characteristics, namely, 10,000 pound load; maximum outreach of 56 feet 9 inches; hoisting height of 58 feet 3 inches, and rail gauge of 27 feet 3 inches.

Pacific Marine Review

The National Magazine of Shipping

December, 1927

SAN FRANCISCO

Golden Gate Repeats with Ingersoll-Rand *Marine Engines*

FOLLOWING the successful performance of the three Diesel-electric ferries "Golden Bear," "Golden Shore," and Golden Poppy," the Golden Gate Ferry Company has placed a REPEAT ORDER for a fourth boat of identical specifications.

Like its three sister ships, the new boat will use Ingersoll-Rand Marine Oil Engines of 400 b. h.p., each being direct-connected to a generator and an exciter.

INGERSOLL-RAND COMPANY
11 Broadway New York City
Offices in principal cities the world over.

58—MOE.

Ingersoll-Rand

Official Organ
Pacific American
Steamship Association

Official Organ
Shipowners Association
of the Pacific Coast

Pacific Marine Review, Vol. 24, No. 12, Published Monthly in San Francisco. Entered as second class matter at the post office at San Francisco under the act of March 3, 1879. $2.00 a year.

Sterling

VIKING—Owned by Lionel J. Smith, of Montreal, Que. 46 ft. long, 10 ft. 6 in. beam, 3 ft. 6 in. draft. Designed and built by Ditchburn Boats Ltd. Powered with a Chevron model 6 cylinder Sterling engine. Speed 16 M.P.H.

In a Yacht

IN a yacht, a few dollars saved in the power plant frequently represents something that has not been done in building that engine, something that, saved in the cost of building, made the price lower.

Perhaps omitted water jackets from around spark plug bosses and valve seats saved cost, at the expense of overheating. Possibly 2½ hours instead of 40 hours testing, single ignition, undersized clutch, rough finish on contact surfaces; there are many details that save cost. Any one thing can leave you on the high seas, stranded and in danger.

Twenty five years ago yachtsmen conceived this company to offer a super-reliable marine product. More power and economy accompanied the tremendous effort in development. How well we have succeeded is illustrated in a booklet describing manufacturing methods.

You might check up the financial rating in commercial indexes. It qualifies STERLING a successful manufacturing company, building a pronouncedly excellent engine, for successful yachtsmen who want and can gratify the desire for, a really fast, safe and dependable boat.

12 — 565 H.P.

STERLING ENGINE COMPANY

1270 NIAGARA STREET BUFFALO, NEW YORK

ANNA MILDRED—Owned by Harry C. Hatch of Toronto, Ont. 65 ft. long, 13 ft. beam, 3 ft. 8 in. draft. Designed and built by Ditchburn Boats Ltd. Powered with two Dolphin model 6 cylinder Sterling engines. Speed 20 M. P. H.

Pacific Coast Representatives:

KING-KNIGHT COMPANY

601 Balboa Building
SAN FRANCISCO

3322 Henry Building
SEATTLE

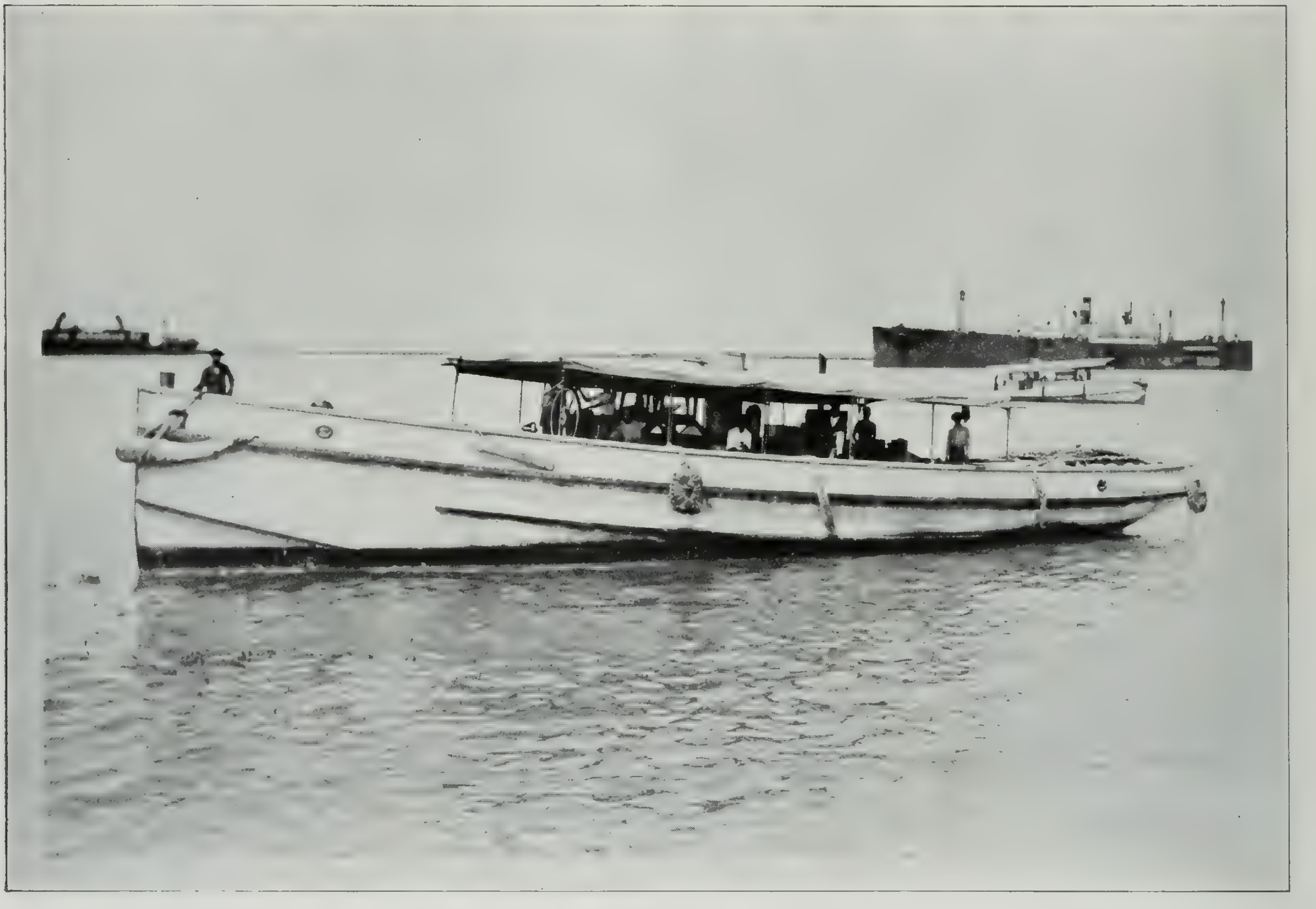
401 Bradbury Building
LOS ANGELES

CONTENTS

December, 1927

Frontispiece 23
Editorials 541
Bridging San Francisco Bay 543
The American Packets, by F. C. Matthews 544
The origin, development, and final ending of the famous New York-Liverpool Packet Lines.
Our New Trade Frontiers, by Dr. Julius Klein 548
Pacific Coast Shipbuilding 550
Pacific Workboat Builders 554
Yacht Samona in Mexican Waters 556
Skoda Shipbuilding Material 556
Anderson & Cristofani Yard 556
European Inland Waterways as Factors in Port Development. By Norman F. Titus 557
An Interesting Shallow Draft Ferryboat 560
Southern Pacific Type Auto Ferry 562
The Golden Type Auto Ferries 564
At the Chief's Desk 566
Cylinder Lubrication of Diesel Engines, by C. G. A. Rosen 568
Auxiliaries, Ship Supplies, Marine Equipment:
  Flettner Rudder 570
  Do the Sheaves Fit the Rope? By Walter Voigtlander 571
  The Viking Engine 571
  New Series Northern Lift Hoist 572
  Foster Pumps 572
  Another Ellis Channel Steel Barge 572
  Largest Motor Liner Sperry Equipped 572
  Winton Business Reaches New High Peak 573
  Dennis Participating Governor 573
  H. F. Alexander Exide Equipped 553
  Important Clutch Announcement 574
  New Sales and Engineering Service for Los Angeles and Long Beach Harbors 574
Marine Insurance 575
Organization and Trade Notes:
  De Laval-Pacific Co. to Cover Entire Pacific Coast Direct 580
  American-La France and Foamite Cooperation 580
  Duff Promoted; Chas E. Lowe 580
  A. L. Becker 574
American Shipbuilding 581
Trade and Traffic Trends:
  Our Billion Dollar Trade with Latin America .... 27 Adv. Sec.
  Foreign Trade in Pacific Northwest .... 29 Adv. Sec.
  Bananas by Shipload .... 29 Adv. Sec.
  Freights, Charters, Sales .... 41 Adv. Sec.
Who's Who Afloat and Ashore .... 31 Adv. Sec.

UNION



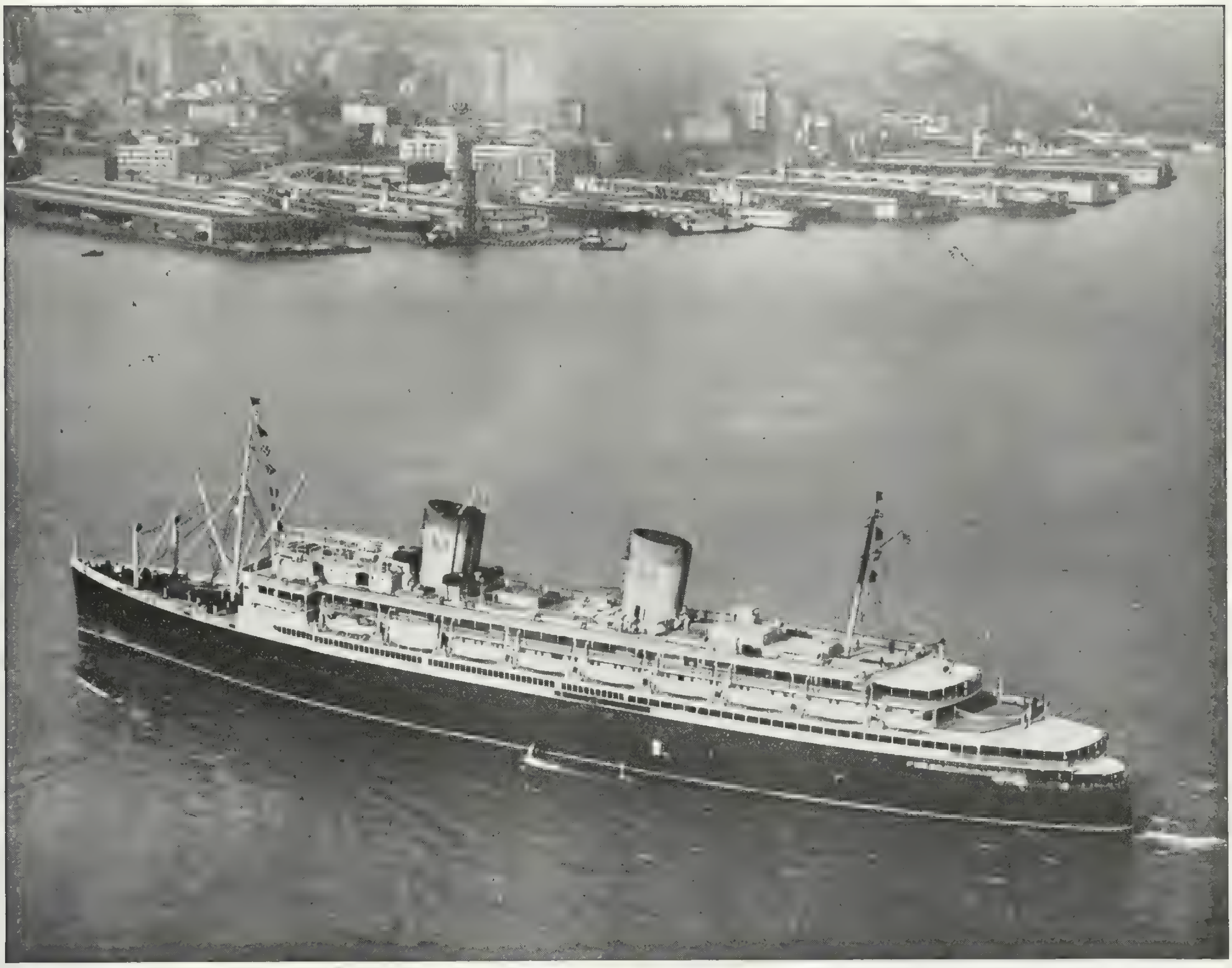
"SIMMIE,"
Philippine Island Tow Boat.

Power—225 H.P. 6-cyl. direct reversible UNION Diesel Engine

Length—72 feet.
Breadth—18 feet.
Speed—11 knots.
Fuel capacity—30 days.
Draft—8 feet 3 inches.

The Simmie tows daily a rock scow loaded with 500 tons at a speed of 6 knots. This is a tow of about 30 miles each way. In addition she does her regular harbor work.

UNION GAS ENGINE CO.
OAKLAND, CALIFORNIA, U.S.A.
ESTABLISHED 1885



The Malolo Swinging Into Berth at Her Home Port

An Aerograph showing this splendid new Matson Liner making her maiden bow to the City of St. Francis

{Copyright by Aerograph Company, Oakland, California}

The tanker "Armac," owned by the A,, M. & O. Transport Co. of Vancouver, B.C., under charter to Shell Oil Co., is 86′ long x 20′ beam x 11′ draft. Her main power is a 6 cyl. 180 h.p. Washington-Estep Diesel engine, making a speed of 9 knots.

WASHINGTON IRON WORKS

There's no rest for the "Armac"

Up and down the British Columbia Coast, the Diesel oil tanker "Armac" is constantly on the go in an isolated district where engine reliability is a stern essential. And because she is "out all the time," with no lay ups for repairs, she is equipped with a Washington-Estep Diesel to assure dependability and economy.

"WASHINGTON-ESTEP" DIESEL ENGINES

are built in both marine and stationary types from 36 to 1800 b.h.p. four-cycle, cold starting, full Diesel, airless injection principle. They are efficient in operation and both rugged and accessible in construction, with these special features:

Removable Cylinder Liners, eliminating expansion stresses on cylinder.
Open Side—easy access to crankshaft and all bearings.
Deep and Rigid Base—no danger of crankshaft breakage.
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Extra Large Caged Valves for maximum power.
Perfected Solid (airless) Injection System.

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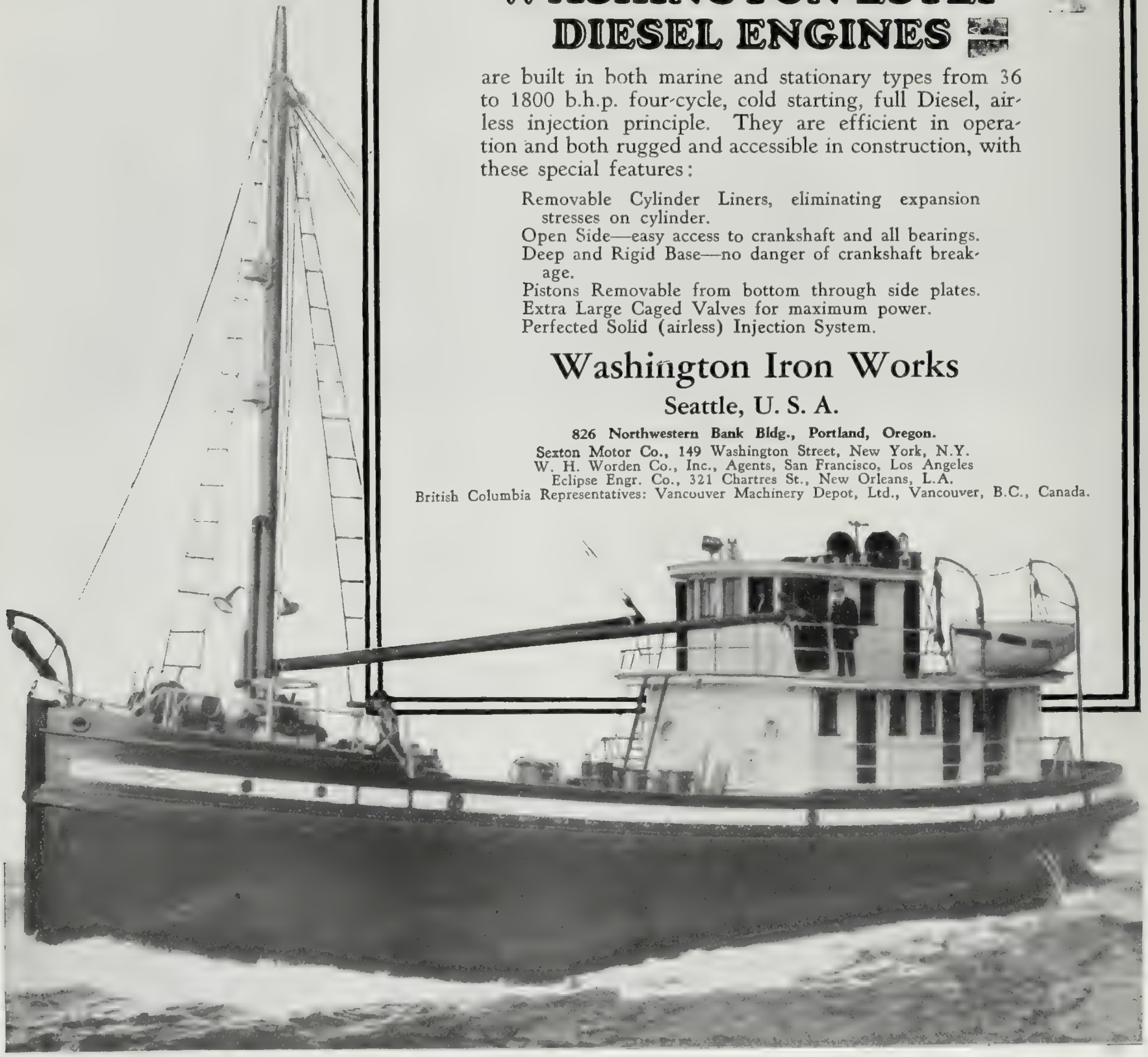
826 Northwestern Bank Bldg., Portland, Oregon.
Sexton Motor Co., 149 Washington Street, New York, N.Y.
W. H. Worden Co., Inc., Agents, San Francisco, Los Angeles
Eclipse Engr. Co., 321 Chartres St., New Orleans, L.A.
British Columbia Representatives: Vancouver Machinery Depot, Ltd., Vancouver, B.C., Canada.



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James S. Hines,
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Bernard N. De Rochie,
Vice-Pres. and Manager.

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Editor.

Paul Faulkner,
Advertising Manager.

American Shipbuilding

THE year 1927 has furnished some rather puzzling chapters in the history of American shipbuilding. Its high points have been the delivery of the Malolo by Cramps, the launching of the California at Newport News, the delivery of nine large diesel-electric ferries on San Francisco Bay, the completion of a splendid modern, first-class passenger liner at Los Angeles, and the keel laying of a sister to the California at Newport News. These, together with a large amount of barge building, some small coastwise vessels, numerous yachts, cruisers, tugs, and workboats, large lake freighters, tankers, coast guard cutters, lightships, ferries, and fireboats, make quite a respectable program and one which in prewar days would have been thought adequate had there been the then usual naval building program to keep the gaps filled with profitable work.

Competition, however, is keen.

The navy yards as well as the commercial shipbuilding plants were greatly expanded during the war.

Congress feels obligated to favor the navy yard estimates over shipyard bids, and feels no responsibility for keeping commercial shipyards busy.

Americans building ships for overseas service can build them at very much less cost in foreign shipyards and operate them much more economically under foreign flags.

So 1927, which is a year of improved conditions in world-wide shipbuilding, sees American shipyards getting more hopelessly involved and two of the oldest and best shipyards in the country forced to close down.

Shipbuilding, in either wood or steel, is well worth fostering. No industry distributes a larger proportion of its gross receipts in wages to labor. Any aid given to shipbuilding by the federal government immediately gives profitable employment to large numbers of American citizens.

Several methods of extending help have been proposed and will probably be up for consideration at the next Congress. Notable among these is the bill proposing a rebate to the shipowner of all customs tariffs that would have been collected on the materials going into his vessel had these materials been imported, this rebate not to exceed 30 per cent of the total cost of the vessel; new vessels for foreign trade only to be eligible under this scheme, and all such vessels to be built to plans and specifications approved by the Shipping Board.

The aid proposed in this plan takes care of the differential against the shipbuilder, but the plans and specifications having to be approved by the Shipping Board may place a burden on the shipowner. If, for instance, an American owner in the overseas trade wished to build a ship of a certain type to his own plans and specifications and could get it built at $70 a deadweight ton in Europe and $100 a deadweight ton in America, this 30 per cent rebate would put the American shipbuilder on an even basis, and the American shipowner would certainly patronize home industry. However, if on turning over his plans to the Shipping Board, that body insisted on changing the owner's specifications, there might be set up additional costs which would again give the European shipbuilder the advantage.

Our Ocean Shipping

THE Annual Report of the Secretary of Commerce of the United States for the fiscal year ending July 1, 1927, is available for publication as we go to press. Under the subhead of "Ocean Shipping" the report sums up the situation as follows:

"Noteworthy encouragement prevails in ocean shipping throughout the world. Basicly, the industry has made substantial progress toward stability. The volume of oversea trade has increased slowly but steadily, and only a small amount of idle tonnage remains out of employment.

"Idle tonnage in the leading maritime countries of the world reached a new low postwar level and totaled only 3,968,000 gross tons at the end of July, 1927, or 35 per cent less than a year earlier. The decrease in idle tonnage in the United States amounted to 853,000 tons, or 22½ per cent. Shipping in existence throughout the world, including only seagoing steel and iron steam and motor vessels of 100 gross tons and over, aggregated 59,612,000 gross tons, an increase of 1 per cent over that of the previous year. In contrast with the general trend there was a reduction in the fleet of the United States amounting to 180,000 tons, or about 2 per cent.

"Shipping under the American flag, documented for the foreign trade, declined by 11 per cent, but that documented for the coasting and Lake trade increased by 7 per cent. American vessels carried 31 per cent of the tonnage of our ocean-borne foreign trade in the calendar year 1926 as against 37 per cent in the preceding year. This drop, however, was largely the result of the heavy shipments of coal to Great Britain following the British coal strike; such shipments, naturally, were carried by tramps, relatively few of which are under the American flag.

"The outstanding feature in shipbuilding during the year was the growth in the construction of motor vessels. At the close of June, 1927, the tonnage of such vessels being built throughout the world even exceeded the tonnage of steam vessels. In the United States, however, the reverse was true; motor vessels represented only 20 per cent of the total."

Eleven per cent decline in American shipping engaged in foreign trade and seventeen per cent decline in the percentage of American foreign trade carried in American bottoms.

Wake up, Congress! Your "Tyrian Heritage" is being exchanged for a mess of red (tape) pottage.

Railroads and Shipping

NINETEEN TWENTY-SEVEN is bringing forth many proposals for solving the American Merchant Marine Problem. The majority of these are the regular annual crop, some are rather original, but there seems to be pervading all of them a more earnest spirit and a greater determination that something must be done.

Edward N. Hurley, former chairman of the United States Shipping Board, evidently feels some responsibility in the matter, for he is making some very pertinent and helpful suggestions. As a manufacturer interested in overseas trade, Mr. Hurley has much at stake and feels strongly that the American merchant marine should be established on a permanent basis. An analysis of the factors involved shows that American railroads and American shipping are mutually interdependent and that common ownership of these two means of transport should be encouraged. The railroads are better prepared to handle shipping than any other large shoreside corporations, and many of the great railroad systems of our chief maritime competitors are owners and operators of large fleets of merchant vessels.

In an open letter to the United States Shipping Board, dated November 8, 1927, Mr. Hurley suggests encouragement of ship operation by railroads as one way to insure permanent interest in a privately-owned merchant marine, to build up a scientific commodity rate structure for marine freights, and to insure some new construction for American shipyards.

In connection with the shipbuilding industry, Mr. Hurley proposes a revolving fund of $550,000,000 to loan money at an interest rate of 2½ per cent per annum to shipping companies for building modern American passenger and/or freight vessels in American shipyards. Loans up to 75 per cent of ship cost would be made, this to be done with the understanding that for every vessel built with funds so borrowed, "a given number of the present war-built fleet of ships now owned by the government must be purchased by the borrower at the same terms now in force by the Shipping Board."

The mortgages securing these loans would provide for a sinking fund by requiring a semi-annual payment of an amount equal to 2¼ per cent of the loan, first such payment to be due 2½ years after date of mortgage. These payments to go into a trust fund which would be invested under proper safeguards and the interest as accumulated added to the fund. Assuming this interest as 4 per cent, compounded semi-annually, the trust fund would pay off the mortgage note in 18½ years from date, or in 32 semi-annual payments. If the interest earned by trust fund is credited against the interest payments on the loan, it will be found that the average rate of interest paid on balances is about 1 1/3 per cent. And on a basis of 6 per cent as the interest charge on the balance of the cost above the government loan, the total average interest cost figures 2.87 per cent.

This is a very nicely worked out financial plan and would, if put into operation, offset the high capitalization charges against the American shipowner and the American shipbuilder, and the plan itself, or some modification of it, should be made freely applicable to all American shipowners building new tonnage . Why tie such a beautiful scheme up to the obsolete freighters of the Shipping Board fleet, especially since those ships are being sold on a guarantee of ten years' continued service in present routes? The main reason in the mind of any American shipowner for any desire to build new tonnage is to get fast, modern, up-to-date tonnage. If the Shipping Board is to insist on passing off with each loan under the Hurley plan two or three of its slow, obsolete freighters to be operated for ten years on a specified route, the very object of the loan is defeated by the terms.

American shipping and American shipbuilding are in the class of national necessities, and our federal government can well afford to lighten the burdens under which these two key industries are now gradually disintegrating.

United States Coast Guard

THE Coast Guard established in 1790 is one of the oldest organized departments of the federal government. For a number of years after its organization the Coast Guard formed the only naval force protecting the United States. In fact, the first commission to any officer afloat granted by George Washington as President was issued to Captain Hopely of the Revenue Cutter Service, which afterwards became the Coast Guard.

Today and for many years past the primary responsibility of the Coast Guard is safety of life and property at sea. During the past five years approximately 85,000 persons aboard ship have been assisted in emergency, and vessels having a total value of $267,175,065 have been helped to safety. In this work at least 15,000 lives have been saved or rescued. Our Coast Guard maintains a considerable share of the work of the International Ice Patrol Service, which functions so perfectly that since its inception not a single life has been lost in the North Atlantic through collision with iceberg.

This year's Mississippi flood brought a special call to which the Coast Guard responded with its usual promptness and efficiency. Within twenty-four hours from the time that Rear-Admiral F. C. Billard, Commandant of the Coast Guard, received the call for help, two special trains with 20 power surf boats mobilized from the Jersey and Delaware coasts were rushing to Natchez, where they arrived on May 3, ahead of the crest of the flood. Within a few days the Coast Guard had 674 officers and men, 168 vessels and boats, and large quantities of food stores available for the work. Men and boats worked continuously for from five to six weeks, removed from positions of peril to places of safety nearly 44,000 persons, and saved from drowning over 11,000 head of livestock. Florida, during her hurricane experience, saw the same variety of quiet, efficient, helpful service and learned to appreciate the value of Coast Guardsmen.

The Coast Guard maintains a chain of life-saving stations along the entire coastline of the United States on both oceans and all of the Great Lakes.

These stations are most busy and most numerous in the vicinity of Cape Hatteras and Cape Lookout on the Atlantic Coast and along the coasts of Washington and Oregon on the Pacific.

Bridging San Francisco Bay

DURING the past few years a number of important bridges have been constructed over San Francisco Bay and its tributaries. During the next few years several more such bridges will be built. Popular and political interest, however, centers in the two greater projects of bridging the Golden Gate and bridging direct from San Francisco to Oakland.

The former project is now in the legal phases of bridge district organization, and has not yet produced an entirely satisfactory design from the standpoint of the bridge engineer.

The San Francisco-Oakland project has produced many designs more or less satisfactory to the practical bridge engineer, but unsatisfactory to the shipping interests and to the Navy Department.

One factor which has a common bearing on all the designs for bridging San Francisco Bay in that portion lying between Hunter's Point on the south and Yerba Buena Island on the north is the depth (water and mud) and the character of the rock bottom under the bay. This factor has never been adequately investigated or tested, and until investigation and test of foundation are made, no estimate of cost or design of superstructure can be even approximated.

With the completion of the new Hudson River Bridge at 179th Street, New York, bridge engineering will demonstrate its ability to take care of spans of the length asked for by navigational interests, provided good rock foundation is available.

Congress owns and controls the navigable waters of San Francisco Bay. The State of California owns the submerged lands, the tide lands, and, in this case, the San Francisco waterfront. The City and County of San Francisco is vitally interested as the county on the left bank of the stream controlling under the United States Army Engineers the franchise for and location of the bridge.

Would it not be a good plan for these interests to combine in making a competent survey of the bay bottom, the results of which would be on file as a public record available for all engineers and city planning experts, so that the location of the bridge may be determined as an intelligent compromise between the best commercial and the best engineering site?

The table herewith gives the particulars of some of the more notable suspension bridges of America. It is compiled from information furnished by the John A. Roebling Son's Company of California. John A. Roebling was the builder of Brooklyn Bridge and the firm founded by him has supplied the cable for all the large American suspension bridges.

Obituary

James Robertson, age 54, owner of the Robertson shipyard, at Alameda, was accidentally killed in San Francisco, November 19, while helping to load a heavy piece of woodworking machinery on to a truck.

Robertson has operated a shipyard on the Oakland Estuary for the past twelve years, and prior to that built many good wooden vessels at Benicia. He is survived by two sons, Russell and Milton, who were his partners in business and will carry on at the shipyard.

Louis Weule, age 86, died at his home in San Francisco November 17. For thirty-five years Weule's nautical instrument store first at Battery and Washington Streets, and later on California Street, has been a rendezvous for shipping men calling at San Francisco.

Weule was born in 1841 in Bockenem, Hanover, Germany. He came to San Francisco in 1864 round the Horn on the good ship Reindeer. He was noted for kind deeds, generosity, and upright dealings, and leaves thousands of friends in the San Francisco Bay region and on the ships of all nations.

His two sons, Ernest L. and Arthur F. H. Weule, have been his partners in business for many years and will carry on at No. 6 California Street.

Comparison of Suspension Bridges

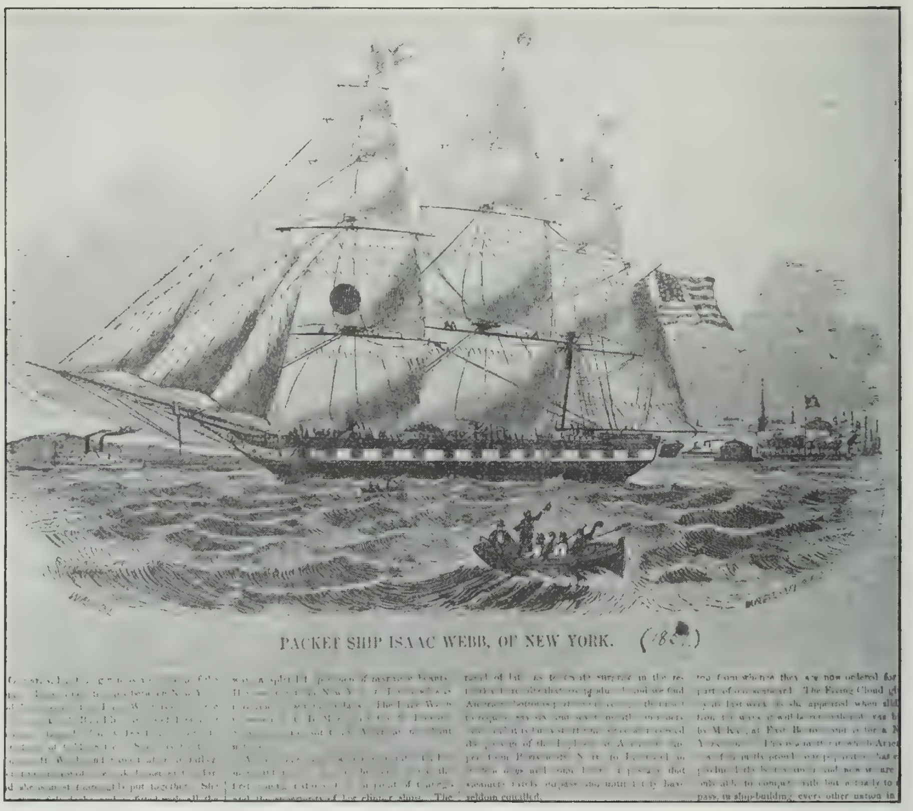
LOCATION	BROOKLYN East River New York City	WILLIAMSBURG East River New York City	MANHATTAN East River New York City	BEAR MOUNTAIN Hudson River Bear Mountain, N.Y.	DELAWARE RIVER Delaware River Philadelphia	MID-HUDSON Hudson River Poughkeepsie, N.Y.	HUDSON RIVER Hudson River Fort Washington 179th Street New York City
Date of Erection	1870-83	1896-1903	1901-10	1923-24	1922-26	1926-	1927-
Length of main span in feet	1,596	1,600	1,470	1,632	1,750	1,500	3,500
Number of cables	4	4	4	2	2	2	4
Number of strands per cable	19	37	37	37	61	19	61
Diameter of cable in inches	15½	18¾	20¾	18	30	16¾	36
Total number of parallel wires in main cables	21,432	30,784	37,888	14,504	37,332	12,160	105,896
Total weight of wire in main cables in tons	3,272	4,344	6,108	1,914	6,626	1,998	27,200
Total length of each cable between anchorages in feet	3,578½	2,985	3,224	2,640	3,540	3,287	5,227
Total strength of main cables in tons	44,800	89,200	113,200	47,200	118,000	39,000	347,880
Diameter of individual wires in inches	.187	.192	.195	.195	.195	.195	.195
Height of towers in feet	273	310	291	350	385	315	560
Number and diameter of suspender ropes of each panel point	1⅝ & 1¾" diam.	4-1¾" diam.	2-1¾" diam.	2-2¼" diam.	4-2¼" diam.	2-1⅞" diam.	8-2¾" diam.

The American Packets

The Origin, Development, and Final Ending of the Famous New York-Liverpool Packet Lines

By F. C. Matthews

Here is an authentic historical account by the noted author of "American Clipper Ships," setting forth the development by American capital, under the American flag, of the first regular, dependable, fast passenger services on the North Atlantic, and of the loss of those services to British steamers. The remarks of Captain Urquhart, herein contained, are as applicable today as they were when written thirty years ago. Illustrations of this article are from rare old prints loaned by Captain L. P. A. Gruelund, of Copenhagen.—Editor.



PACKET SHIP ISAAC WEBB, OF NEW YORK. (18[illegible])

THE American sailing ship known a century ago as a Packet was originated to supply a regular and dependable service for the transportation of cargo and passengers, mails and treasure, government ministers and despatches, in fact, everybody and everything crossing the Atlantic between ports of the United States and Europe.

Prior to their inception in the early years of the nineteenth century this service had been supplied by a fleet of small English vessels nicknamed, and in many instances not inaptly, "coffin brigs." These averaged about 180 tons burden, not as large as some later-day Hudson River sloops, and a list of those operating in the year 1805 shows that they numbered sixteen. Each made two round voyages yearly between Falmouth and New York, plying direct during the four wintry months and calling at Halifax each way during the other eight months' sailings from each end being monthly. A list of their names shows that they were called after members of the family of old King George—his wife, sons, daughters, sons-in-law, ministers of the crown, etc. There appear, the Queen Charlotte, Prince Ernest, Princess Elizabeth, Lord Charles Spencer, and other notables, and finally the Windsor Castle.

This service, although later augmented by transient ships, was anything but satisfactory and in 1816 a group of New York merchants and ship owners decided to remedy matters, with the result that the celebrated "Black Ball" line of sailing packets was established to run between New York and Liverpool. It was not, however, until the following year that the full first unit of four vessels was in commission, when a sailing was made from New York and also from Liverpool on the first of each month. Results were very satisfactory and in a few years a second unit of four ships was added to the fleet, allowing of an additional sailing each month, on the sixteenth.

About this time two new "lines" entered the field, the "Red Cross" and the "Swallow Tail" each starting with four ships, whose sailing dates were the 24th and the 8th of the month, respectively. Following these, and prior to 1836, there had also been established the "Saint" or "Red Star" line, with sailings on each 13th and the "New" or "Dramatic" line, whose sailing day was the 1st of each month. These important lines, supplemented by those of lesser magnitude operated by Handy & Everett, Zerega & Co., Harbeck and Co., and Howland & Frothingham, furnished a service that was then known internationally as representative of safety, reliability, and punctuality. In 1850 and in 1852, respectively, the "Black Star" line of Williams & Guion and the Spofford Tileston & Co. line entered the field and transportation across the Atlantic was as near perfection as could be reached by any combination of capital, brains, and brawn, considering the period. These were the times when the packet ship was in her glory.

The average number of immigrants entering the ports of the United States for the thirty years after 1816 was, in round numbers, 54,000 annually, and for the following nine years, 272,000 annually. This total of over 4,000,000, perforce came by sailing vessel and naturally the history and records of these packets was a matter of uncommon interest for many years, the names of the vessels of the different "lines" being familiar words in homes thoughout every section of the then settled portion of the country. It is of record that one ship of the Black Ball Line made 119 round voyages between New York and Liverpool in the 29 years prior to 1860, during which time she brought 30,000 passengers to the United States. It must not be overlooked that this article applies only to New York-Liverpool "liners," lack of space precluding mention of details of others operating to London, Havre, Bremen, Antwerp, or those out of Boston or Philadelphia.

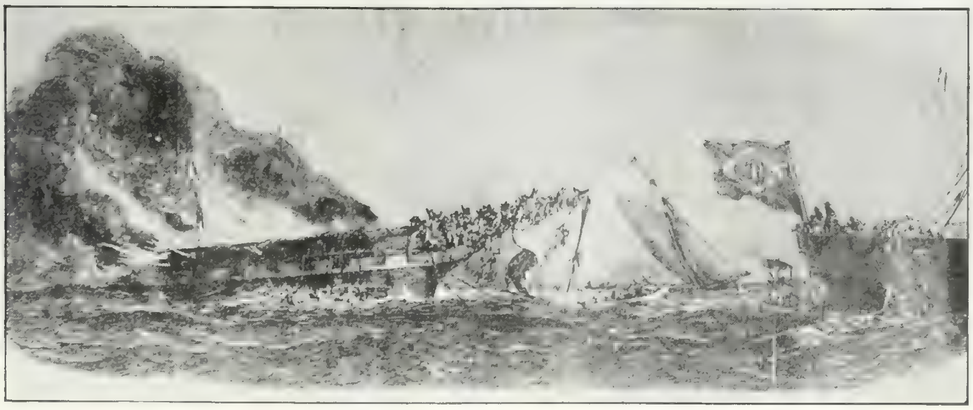
The promoters and original owners of the Black Ball Line were Isaac Wright & Son, Benjamin Marshall, and the brothers Francis and Jeremiah Thompson, all important merchants and ship owners of New York. Some years later they were succeeded by the prominent firm of Goodhue & Co., although after 1836 the actual management of the line was in the hands of Captain Charles H. Marshall, a former master of different packets. Eventually the firm of Charles H. Marshall & Co. was formed and continued until the early eighties, although Captain Marshall died in 1865.

The pioneer of the Black Ball fleet was the full rigged ship Amity, built at New York in 1816 by Forman Cheeseman. She was only 108 feet long, 28 feet 6 inches beam, 14 feet 3 inches depth of hold, about the dimensions of a later-day brig. She was followed by the James Munroe, 118 by 28 by 14 feet, 424 tons register. Those that followed were somewhat larger, the Pacific, built in 1824, being 586 tons, and increase in size continued until the Jeremiah Thompson was launched in 1854, 1900 tons register. Among the many notable ships that were members of the Black Ball fleet at one time or another were the New York, England, Yorkshire, Columbia, Fidelia, Isaac Webb, Great Western, and Harvest Queen. Their last accession was the Charles H. Marshall, built by William H. Webb at New York in 1869, and she was also the last full rigged ship to be built at that place. Following the loss of their ship Isaac Webb in 1881, Marshall and Co. sold the remainder of their vessels and retired from business. The Black Ball Line was always the most important in the trade, was well managed, and made money for its different operators. Its vessels were conspicuous on the ocean by having a large painted black ball below the close-reef band in the foretopsail. Their house flag was a black ball in the center of a crimson swallow-tail.

The Swallow Tail Line was established by Thaddeus Phelps and the firm of Fish & Grinnell, afterwards Grinnell, Minturn & Co. Among the early ships of this line were the Silas Richards and York, each of about 450 tons, Pennsylvania, George Washington, and Independence (built in 1831), 732 tons. Later additions that became prominent were the Washington , Ashburton, Patrick Henry, New World, Henry Clay, Cornelius Grinnell, Liverpool, Constitution, Queen of the West, and Hottinguer. The Constitution, of about 1400 tons, was called the finest merchant ship ever built up to her time. Grinnell, Minturn & Co. was one of the first firms to become interested in the development of clipper ships, being purchasers of the Flying Cloud and others nearly as famous, as they came off the stocks. Their transatlantic sailing packets were operated until about 1882, although no passengers had been carried for some ten years previously. The house flag of their ships running to Liverpool was a blue, white, and red swallow-tail, the arrangement of these colors being changed to red, white, and blue on their London packets.

The Red Cross Line was originated by Byrnes, Trimble & Co., flour and grain exporters, and Samuel Hicks, a large shipowner of New York. Their ships were the Manhattan, 110 by 28 by 14, 390 tons; China, 122 by 31 by 16, 533 tons (both built at New York in 1819 for Samuel Hicks), the Panther, John Wells, Meteor, and Hercules. Both Byrnes and Hicks died prior to 1831, and as none of their ships appear in lists of packets' passages in 1837, it is presumed that the line was discontinued. However, a Red Cross Line was in the field in 1843 with David G. Ogden as manager, his associate owners being E. D. Morgan, an importing merchant, afterwards governor of the State of New York, Francis B. Cutting, and others. Before the construction of the Dreadnought for this line in 1853, it had been composed of six first-class ships, the St. George, St. Patrick, Andrew Forster, Driver, Racer, and Highflyer. Of these, five were wrecked, burned, or went missing before the Dreadnought was completed, and in 1856 the Highflyer also met her fate, never being heard of after leaving San Francisco for China on a chartered voyage. This left the Dreadnought sole member of the fleet until the Victory was built in 1857. The Dreadnought was sold in 1864 for the California trade and was lost near Cape Horn in 1869. The Victory was sold foreign in the early seventies and the flag, showing a large red cross on a white field, was seen no more on the high seas.

Captain Robert Kermit, an owner in the ship St. George (an earlier ship than the Red Cross ship St. George), persuaded merchant Stephen Whitney and banker Nat Prime, to become owners of a new ship St. Andrew, and thus was started the "Saint" or "Red Star" Line. Ships later added were the United States, Virginia, Sheffield, Bermingham, Waterloo, West Point, and Constellation. This line is said to have never been much of a success, although a very short westward passage made by the St. Andrew, arriving at New York the day before Christmas 1834 was the means of making a large amount of money for her owners. Walter Bar-



Fire at sea was always a great terror in the old immigrant packet ship days. We show here a spirited picture of the burning of the immigrant ship Ocean Monarch off the mouth of the Mersey July 1848. The Ocean Monarch of Train's White Diamond Line of Boston-Liverpool packets was en route from Liverpool with 396 souls aboard. Over 300 lives were lost in this fire.

rett, in his "Old Merchants of New York," describes how the ship brought intelligence of an advance in the price of cotton in Liverpool, which news could not become public property until after Christmas. Details are given as to how Whitney and Prime dispatched a special messenger to New Orleans with letters of credit in the amount of one million dollars to be used in buying up all the cotton found in first hands. The messenger bribed stage drivers and Mississippi steamboat captains not to make stops except when absolutely necessary, and so reached New Orleans in eleven days from New York, three days ahead of the Great Southern mail, which had left two days before him. Before night fifty thousand bales of cotton had been purchased at about $60 per bale. This was sold at an advance of $25 to $30 per bale. The messenger, who was Walter Barrett himself, was awarded the profits of 200 bales, but Captain Kermit was only nominally benefitted and the Saint Line finally went down. Its flag was a red star in the center of a blue swallow-tail.

In 1836 E. K. Collins, Jr., who had been associated with his father, a former sea captain, in operating a small line of vessels between New York and Vera Cruz, established a new line of packets to Liverpool which was nicknamed the Theatrical Line. His ships were the Garrick, Siddons, Shakspeare, Sheridan, and Roscius. They were successful until Collins in 1850 started running a line of large wooden side-wheel steamers under a subsidy from the government, after which his sailing fleet was neglected and allowed to go to destruction in hull and rigging. The steamers were named Pacific, Arctic, Atlantic, Baltic, and Adriatic, and they soon had the Cunard steamers beaten out of sight. However, the Pacific and Arctic became steamship coffins for hundreds, the subsidy was withdrawn or rather not renewed, and the whole Collins structure went to smash with a loss of millions of dollars. The Roscius was the favorite ship of David Brown, of Brown & Bell, her builders, who used to say that nothing could beat her. She was 180 feet by 36½ by 22, swung a mainyard of 87 feet, and her main truck towered 187 feet above her keelson. The flag of this line was a blue above white field, with a white L in the blue portion and a blue L in the white. It disappeared from the high seas with the failure of the line in 1858.

Spofford, Tileston & Co.'s line was established in 1852 with the Henry Clay (the rebuilt ship of the Swallow Tail line, which had been partially burned), the Orient and Webster, new ships of about 1700 tons, built at Portsmouth, New Hampshire, and the Calhoun, Ellen Austin, and Arkwright. For two years in the early sixties they also owned and operated the clipper ship Invincible, but sold her in 1863 for long voyage work. Before 1870 the other ships had been sold or diverted into other trades. The flag of this line was a white S T in the center of a full-sized blue cross on a yellow field. On her passage from the yard of her builders at Portsmouth in 1853, the Webster covered the distance, 378 miles dock to dock, in 36 hours, called at the time an unprecedented run.

Packet Ship Roscius of Collin's "Theatrical Line."

In February 1850 the new ship Star of the West arrived at Liverpool in 16 days from New York, where she had been built for Samuel Thompson's Nephew & Co. expressly for operation in the new Black Star Line of packets. This line was operated by Williams & Guion, later Guion & Co., whose fleet also included the Adelaide, Chancellor, Cultivator, Belle Wood, John Bright, Resolute, Guy Mannering, America, and Australia. Although a considerable portion of the capital invested in this line was English, the fleet was under the American flag until the beginning of the Civil War, when the stars and stripes were supplanted by the British ensign. In the early seventies the last of their sailing ships was sold and the line went extensively into steam. Their two steamers, Alaska and Arizona, were the first of the "ocean greyhounds," and when they came out in 1881-1882 established records for the fastest passages made across the Atlantic, eastward and westward. Towards the end of the last century Guion & Co. sold all their vessel property and retired from business. The flag of this line was a black star within a white diamond on a blue field.

Contrary to the general supposition, the packet ship was not of sharp model, although in the early fifties a few clippers were built for that business. These were the David Crockett, Invincible, Racer, and Staffordshire, the latter running out of Boston, but none of them were more than a few years in the service and the two last-mentioned were wrecked after a short career. It was claimed that ships with bluff bows, wall sides, and heavy, square sterns were the best adapted to transatlantic trade, although later-day packet models were not so blunt forward as were their predecessors. The celebrated Dreadnought was of a class between clipper and early day packet. The best speed of the latter type was about 11 knots; that of the average of their successors, 12 to 13, under favorable circumstances.

Much has been written about speed records made by the packets, but only a few of these statements can be fully substantiated. One such passage, frequently quoted, is that of the Ashburton, 12 days to Liverpool. Her log of this run shows that on the 12th day out she was in longitude 28, latitude 48, and that her whole time on the voyage was 15 days, 18 hours. Another instance is that of Avelaior, 18 days instead of the 12 days, 8 hours often claimed. As a matter of fact, more depended on the "driving" qualities of the officers of these ships than on their models and, operating as they were, over the same short course for a number of years, it would appear unlikely if at some time or another, each did not meet with sufficiently favorable weather conditions to allow the making of some short passages. A run of 15 to 17 days to the eastward was made by most of these ships at some period, while to the westward with anything under 21 days being rare, nearly all had one or more runs of 25 days to their credit.

The Dreadnought had the best model for fast sailing of any of the ships engaged in the trade, yet her fastest authenticated run to the eastward was 13 days, 8 hours from Sandy Hook to the Northwest Lightship, Liverpool. Her average of twenty eastward passages is 19 days and of the same number to the westward, 26½ days, with 19 days as the fastest.

The Independence, 140 feet long, built in 1834, sailed from New York April 8, 1836, and received her pilot off Liverpool in 14 days, 5 hours. In 1835-1836 she was 76 sailing days in making two round voyages, and in 1841 was 77 sailing days in two rounds, remarkable time.

In 1836-1837 the Sheffield made five successive passages to the eastward in 91 sailing days, followed by a sixth in 16 days, an average of under 18 days. During a period of six years the average of passages made to the eastward by the Liverpool, 1180 tons, built in 1843, is 23½ days, and to the westward, 34 days; shortest eastward, 17½ days and longest, 28 days; to the westward, 26 and 52 days respectively.

The shortest passage made by any packet ship from Liverpool to New York is 16 days, made by the Yorkshire in November 1846. In March 1845 this ship made the run in 21 days, the shortest made about that time. The westward run of the Waterloo, 18 days, and that of the Driver, 19 days, were also much shorter than other seasonal passages. On July 8, 1836, there left New York the packets Sheffield, Columbus, and George Washington, and the first-class cargo ships Star, Congress, and Josephine, besides six others, a total of twelve, all bound for Liverpool. The three packets fell in with each other off the Banks of Newfoundland and then parted company. The George Washington passed Holyhead in the forenoon of the 25th and entered the Mersey during the afternoon. The Sheffield followed three hours later, while the Columbus arrived the following day. The other ships came in from four to ten days later. In February 1837 the Columbus engaged in a race with the new packet ship Sheridan for a purse said to have been $20,000, equally contributed. Both ships sailed from New York on February 2 and the Columbus made the passage to Liverpool in 16 days, winning by two days.

The packet ships were built of oak and put together in the strongest possible manner, with spars and rigging fitted to stand up under hard driving in all kinds of weather. The percentage of their loss by fire is said to have been slightly greater than that by shipwreck. After being retired from their original calling, many rendered first class service in other trades for years. The John Jay, 540 tons, built at New York in 1827 for Howland & Frothingham's line was broken up at San Francisco in 1879. After being displaced by larger packets she had been a general trader, then a whaler braving the ice in the Behring Sea, and thereafter a coal drogher on the Pacific Coast. The Black Ball liner Jeremiah Thompson, built in 1854, went out to San Francisco in 1868; traded between that port and New York or Liverpool until 1878, and then became a coast coal carrier, lasting until 1892, when she also was broken up. The Columbia, built in 1846, another Black Ball ship, also went to the Pacific Coast and had an active sea life of over fifty years,

The packet ship Southampton of the Morgan Line.

Captain W. W. Urquhart became master of the American Eagle, a London packet out of New York, in November 1861 at the age of 23. He retired from the sea in October 1881, following the sinking of his ship Isaac Webb in a gale when homeward bound from Antwerp partly laden with Spiegel iron. All hands were rescued by the steamer Illyrian. Captain Urquhart ranked among the highest in the profession of packet masters, and his little book of reminiscences is authoritative and most interesting. The following is quoted therefrom as showing general conditions of the service under consideration during the height of its glory, say between the years 1840 and 1865.

"The American flag could then be seen at the peak of the finest ships afloat, in every navigable water, commanded and officered by native Americans, men of intelligence, courage, and seamanship. We should have continued to reign supreme upon the sea up to the present time and probably would have done so had it not been for many foolish laws that have existed in this country for years. With Yankee ingenuity in equipment and continued superiority in management, we should have been enabled to compete with foreign nations. It has been admitted by English shipowners that in modelling, rigging, and handling ships we had no equal, and I need not tell the readers of American history that the Yankees have always been a success at sea, both in the navy and merchant marine. But the bitter cup of humiliation in the loss of our merchant marine is a lasting disgrace, leaving us to be content that other nations should carry on the commerce of the world, while we, with a coast line of over 2000 miles in extent, till the soil and furnish only the cargo to be carried under a foreign flag by the great 25,000-ton turbiners.'

Life Aboard the Packets.

"In the sixties there were a dozen or more lines of sailing ships trading to Liverpool, London, Havre, Bremen, and Antwerp, eight to twelve ships in each line, ranging from one to two thousand tons register. To man these ships there was a captain, first, second, and third mate, boatswain, carpenter, twenty able seamen, more or less, cooks, stewards, stewardess. On the homeward passage, when laden with six to eight hundred passengers, cabin, intermediate, and steerage, more of a crew was required, and a doctor to care for the emigrants. Only about twenty-five cabin passengers could generally be accommodated. Sailors were paid eighteen dollars per month; the officers' pay was thirty to sixty dollars, according to rank. The captain's salary was merely nominal; his chief pay was called primage, five per cent of the freight money and usually the privilege of carrying his family free of charge. Most captains were part owners, an eighth or sixteenth, called a 'captain's interest.' Going to sea in those days was a hard life, but a young man of courage

(Continued on Page 30, Advertising Section.)

Our New Trade Frontiers

By Dr. Julius Klein.*

THE economic history of the world has been a history of frontiers, of pioneering traders adventuring ever westward in search of new lands, raw materials, and markets. This movement started from China, the oldest highly developed civilization of history, swept through Central Asia, started Greece on her career as a great maritime trading nation, made Rome the mistress of the world, and, in modern times, established Europe as the center of world commerce. From Europe the tendency was still westward, and once the hazardous gap of the Atlantic was spanned, America became the great frontier of trade. The history of the United States itself has been a history of frontiers, from the time when Daniel Boone first adventured across the Alleghanies until the last link was forged with the building of our great transcontinental railroads.

Now the circle is complete, the last great frontier has been conquered, and we come to a new era of world history. America, with an economic and industrial organization which is the fruit of centuries of world progress, is facing across the Pacific what is at the same time the oldest and the newest trade area.

With such a truly dramatic setting it is not surprising that the striking character of the developments have been quite in keeping therewith. In fact, it may be safely said that the outstanding feature of our postwar commerce, so far as its general acceleration is concerned, is the literally astounding growth of the transpacific traffic. The rate of its advance has far exceeded that of any other branch of American commerce, whether with Latin America, Europe or elsewhere.

Before the World War (in 1913) our commerce—exports and imports—with these lands from New Zealand around to Japan and westward to India totaled, in round figures, $462,000,000. This represented just under twelve per cent of our total imports and just under seven per cent of our total exports. Last year we did a business with the Orient of $2,215,000,000, of which $1,443,000,000 represented imports and $772,000,000 represented exports. This import trade now constitutes thirty per cent of our total imports, and our exports to the Far East have increased to 14.6 per cent of our total exports. In no other part of the world have we made such rapid advances in the development of both import and export trade as we have with the countries of the Far East. Not only has the actual volume of the trade increased many fold, but the proportion of our world commerce represented by it has more than doubled.

The causes of this extraordinary commercial "revolution" are various, but chief among them have been the demands on the part of these awakening peoples and newly opened areas for increasing quantities of our wares as contributors to their improving standards of living, to their newly inspired desires for their own industries—a reflection of their war-born nationalism and the results of wartime isolation. Then too on the import side there has been, of course, the tremendous increase in our purchases of Eastern raw materials to meet the demand of our rapidly growing industries and our improving every-day comforts. A part, of course, of the increase in import values in recent years has been due to the artificially manipulated prices of rubber and other raw materials by governmental controls.

Europe and America have been paying more than ever before for Oriental produce, and have been taking greater quantities than ever before. The resultant profits have gone not only to merchants, traders, and the European owners of plantations, whose dividends have reached incredible levels (averaging more than thirty-five per cent a year over long periods in many cases), but also to the humbler folk of the Orient, giving them an unprecedented cash margin for expenditure on small luxuries. A typical example of this comes from Palembang, in Sumatra, where the native planters of rubber, during the rubber boom, fell heir to unaccustomed wealth. During the height of the boom they literally had more money than they knew what to do with, and it was not uncommon to see a native hut housing a phonograph, two or three clocks and a melange of other knick-knacks, while the three miles of muddy streets which constitute Palembang's highway system were crowded with American automobiles. To a lesser degree the jute farmers of India, the wood-oil producers of China, the tin-miners of Malaya, the pepper growers of the Dutch East Indies, have profited from the increased demand for Oriental products, either as owners, through increased prices obtained for their produce, or, as workmen, through higher wages paid for labor.

Industrially, also, the Orient has been awakening, and in those lines where unskilled labor may be utilized to advantage some degree of success has been attained. Japan, for example, has developed a large cotton textile industry, India has done the same, and in China over 5,000,000 spindles are in operation, of which more than 3,000,000 are Chinese owned. The Far East now employs tens of thousands of workers in its mills and the new purchasing power represented by their earnings is expanding steadily. India has in Bengal a world center for jute production, and is developing slowly but successfully an iron and steel industry. The spirit of nationalism is slowly evolving in all of the Oriental countries, and in time may give rise to an even greater industrial activity.

At first thought this movement might appear to threaten seriously our export trade in certain competing lines of goods, notably textiles and hardware. The possibilities of such a curtailment, though evident in some commodities, are apt to be overestimated. In the first place the output of the Oriental factories is largely of lower grades which compete more with German or Japanese exports than with our own. Secondly, the outstanding merit of American industry is the speed of its progress; and the rapid advancement of technique with consequent cuts in production costs and improvements in quality of output have been and will continue to be sufficient to maintain a substantial margin of advantage for our trade.

Even more important than these considerations is the fact that this new economic advance across the Pacific will afford a new outlet for the many varieties of special machinery, replacements and supplies which America is so well qualified to provide. Our sales of machinery to this region in 1926 reached the impressive total of $72,000,000, and this is just a beginning. Furthermore this factory development involves the payment of wages which yield a higher income to thousands of the native population than they would otherwise enjoy, and it has already had the effect of increasing their purchasing power noticeably.

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*(Address by Dr. Julius Klein, Director of the Bureau of Foreign and Domestic Commerce, Department of Commerce, before the Chamber of Commerce, Seattle, Washington, November 10, 1927.)

Here, as might be expected, Australia is our best customer, with Japan, New England, and India following in order, while the other Oriental nations are of lesser account. American machinery and American specialties find readier markets in the more highly developed industrial countries of the Orient. Australia has an entirely European population and actively growing industries, Japan has for many years been modeling herself on the industrial nations of Europe, and India is just beginning to follow in their footsteps. China and the Philippines have not arrived to a status of any importance in this field as yet, while the Dutch East Indies and Malaya are almost exclusively agricultural regions.

In the staples which have been sold across the Pacific for many years, America continues to maintain her position, taking the field as a whole, in spite of some losses through competition. Our trade in petroleum products is, of course, universal, and in 1926 it mounted in the East to a value of $106,800,000. Raw cotton has been a large item of export to the Orient since the development of cotton mill industries on the China Coast, reaching for the whole region a total of $126,800,000 in 1926. Despite severe competition, in 1926 we sold to the Far East over $58,000,000 of iron and steel products, over $31,000,000 of lumber and timber, and nearly $15,000,000 of cotton cloth, while our shipments of wheat and flour reached a value of over $23,000,000. Trade in these staples, while not capable of particularly rapid expansion, has nevertheless been increasing steadily as a result of the improved industrial activity of the Far East, and we can look for a continuance of this tendency for some time to come.

It would be unduly optimistic, however, to imply that these great and growing markets of the Orient are ours for the asking. Competition in all of the trade areas of the Far East has been keen in the past and will be even keener in the future. Fortunately for us, perhaps, the purchasing power of the Orient has increased so rapidly that our gains in commerce have been to only a moderate degree at the expense of our competitors, but the time is coming when we will have a real struggle on our hands, if the present rate of progress is to continue.

Much of the trade area on the other side of the Pacific represents territory under the control of European nations—Australia, New Zealand, British India, Ceylon, Malaya, and part of Borneo belong definitely to the British; Java, Sumatra, the Celebes, and most of Borneo belong to the Dutch, while French Indo-China is a French possession. Naturally enough, in those territories the goods of the mother country enjoy an advantageous position. The early colonist-conquerors established great trading houses with ramifications throughout their respective territories, trading houses which still enjoy a predominant position through long custom and the natural advantages which they have enjoyed during many years of operation. When great improvement works are carried out in these colonies with funds derived from the mother country or from the colonial administration, it is inevitable that the necessary machinery, construction materials, supplies, etc., are purchased from the nation in control. When agricultural experiment stations, technical schools, and the like are established, they invariably demonstrate the equipment produced by the mother country, and train native students in the methods common to that country.

In addition to the natural sympathetic preference of colonial possessions for goods of the mother countries there is in some of them a differential tariff which favors Empire goods and which operates to the disadvantage of the American exporter competing in the Far Eastern and Australasian areas. Australia, New Zealand, French Indo-China, and several of the lesser island possessions give substantial preference to goods coming from the mother countries, the preference ranging from an average of 12½ per cent in Australia to an average of 15 per cent in New Zealand, although in some few instances they run as high as 30 to 40 per cent and more on certain commodities. In India, Ceylon and the Dutch East Indies no preferences have been written into the tariff schedules. While such preferences certainly affect adversely the sale of American goods in these markets, it is hard to see how they can be regarded as other than legitimate, and so long as they are not discriminatory we can find no grounds for protesting against them.

All of this is only what might be expected, and it undoubtedly serves to handicap heavily the sale of a great quantity of American equipment in those regions. The picture is not altogether dark in this respect, however, and numerous examples might be cited where colonial governments give American products every chance to compete on an even basis. In the important Government Technical School at Bandoeng, in Java, for instance, there is a large quantity of American equipment in use, and the school is admittedly modeled along American lines. In the government tannery at Lahore, in British India, established as a model tannery for the instruction of Indian youths, practically all of the machinery is American. And on at least one extensive irrigation project in British India the most efficient excavating machinery in use is of American manufacture. Thus, although in general it is true that our products suffer a handicap in these territories, yet more and more are the colonial governments given a measure of freedom in purchasing their supplies and equipment, and in many cases where the American equipment is manifestly superior, it is in use. Where there is not much to choose between American and home country goods, naturally the latter are preferred.

Quite aside from the above, there is the general commercial rivalry of Europe's industries to be met, and with the exception of our canned fruits and some of our canned vegetables, which are practically American monopolies, everything that we export encounters severe competition, particularly in price. This competition applies equally in countries under foreign domination and in the relatively independent trade areas such as China and Japan. Our two keenest rivals in the field are Great Britain and Germany, although practically every European country competes directly with one or another group of our export products. Great Britain has the advantage of being far earlier in the field than we, and the Far East is thoroughly covered by the commercial operations of the great British trading houses, well established as a result of years of unbroken successful operation. Germany, handicapped by the cessation of her activities during the World War, is nevertheless making strenuous efforts to regain

(Continued on Page 30, Advertising Section)

Pacific Coast Shipbuilding

A Review of Conditions 1927 and Prior, a Plea for Aid, and a Few Suggestions for Cooperation Towards Betterment

By A. J. Dickie.

THE Pacific Coast of North America from Balboa to Cape Prince of Wales faces a straight line ocean frontage of 4500 miles, and its coastline presents many varieties of natural problems for the shipbuilder and the ship operator. San Francisco Bay lies almost in the exact geographical center of this coast line, and being one of the few completely land-locked safe anchorage harbors along the entire stretch has naturally developed into the great shipbuilding and ship repair center for Pacific Coast shipping. Here were established the great pioneer wooden shipbuilding plants, and here, in 1881, was established the first steel shipbuilding plant of the coast, the Union Iron Works, a plant which demonstrated the possibility of successful competition with Atlantic Coast yards in all classes of naval and mercantile shipbuilding. Pacific Coast built war vessels were chiefly responsible for victory in the naval battles of the Spanish War, and Pacific Coast steel shipbuilders were holders of many delivery records for both merchant and naval vessels prior to the Armistice in the European war.

These records are all a matter of history and are alluded to here only because they have left their mark on the shipbuilding plant and the shipbuilding traditions of the Pacific. Before the great war we had adequate plant for much future growth; after the war we find ourselves with a plant sufficient to absorb generations of future demands.

Shipbuilders have become, as it were, victims of the consequences of their own eagerness to meet the demands made upon them by the war. Then the shipyards produced ships when ships were demanded for emergency use. Now any shipowner needing new tonnage can buy these emergency products at a small fraction of the cost of new vessels. If the shipowner wants a special type for foreign trade, he can get, and is getting, such type built in European shipyards for about 40 per cent less than the cost price in American shipyards.

So we find that new construction in Pacific Coast yards, as in all American shipyards, consists wholly of special types for coastwise, bay, river, and lake services. These with repair and reconditioning work, allow sufficient gross return to warrant holding most of the organizations together.

In these special type jobs, 1927 has on the whole shown an advance as compared with 1928.

Probably the most important single job was the building of new passenger accommodations in the Los Angeles Steamship Company's steamer City of Honolulu at the plant of the Los Angeles Shipbuilding & Drydock Corporation, under the supervision of Pillsbury & Curtis of San Francisco. This was not a reconditioning job, but new work, the vessel being stripped internally practically to the bare hull. Much favorable comment from naval architects was elicited on this job. One prominent San Francisco member of the profession said: "I did not believe it possible that such beautful results could be obtained at a Pacific Coast yard." Complete description of the steamship City of Honolulu may be found in Pacific Marine Review for June 1927.

Another special job of magnitude, involving three San Francisco Bay shipyards, was the program of ten diesel-electric ferries for San Francisco Bay. Six of these were steel hulls; three built at Bethlehem, Union Plant; two built at The Moore Dry Dock Co.; one built at General Engineering & Drydock Company. Four were wooden hulls, all built at the General Engineering & Drydock Company. These ferries are the finest of their type in America today, and it is only fitting that this should be so, since San Francisco Bay cradled the first diesel-electric ferry. Descriptions and illustrations of these ferries will be found on other pages in this issue of Pacific Marine Review.

Four views of the public rooms of the steamship City of Honolulu. From top to bottom: the foyer of the music room, interior of the music room, vista from the smoking room through veranda cafe, and grand central hall of dining saloon.

The Los Angeles Shipbuilding & Drydock Corporation has a good right to be proud of the interior decoration and arrangement of this splendid passenger liner, which is undoubtedly the finest example of the art of the interior decorator ever built into a ship on the Pacific Coast.

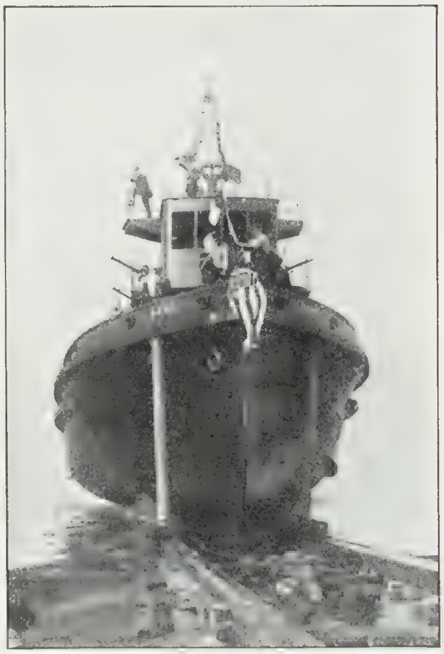
Two other important deliveries of ferries were made during the early months of 1927, when The Moore Dry Dock Company of Oakland turned over to the Key System Transit Company the ferryboats Peralta and Yerba Buena. These two magnificent boats, turbo-electric driven, were the designed products of Naval Architects Hibbs, McCauley & Smith, of San Francisco, and undoubtedly are the finest passenger ferries afloat today. Of all steel construction, with many new and interesting features of hull design, these ferries will easily accommodate 4000 passengers.

Foyer of the dining saloon, steamship City of Honolulu.

Several new fireboats of very special type have been either finished or laid down in Pacific Coast yards during 1927. This Pacific Coast type of fireboat is a speedy, shallow draft, steel hull, equipped with heavy duty high power gasoline engines and fitted with special pumps to give maximum capacity Three such hulls for the City of Portland are being built at the Matthews shipyard at that city, and one for the City of Seattle was recently launched at the yard of the Pacific Coast Engineering Company, Oakland, California. San Francisco, Oakland, and other San Francisco Bay ports will undoubtedly be in the market for similar boats in the not far distant future.

The September issue of Pacific Marine Review features a new coastwise freight and passenger steamer for the Inter-island Steam Navigation Company of Honolulu, contract for which went to the Union Plant of the Bethlehem Shipbuilding Corporation. This fine little vessel, now in frame, will make a very substantial addition to the coastwise fleet of the Hawaiian Islands and will help keep the big plant busy for some months.

The Union plant has also on hand a large reconditioning job on the passenger and freight liner Maui of the Matson Navigation Company. The passenger quarters on this vessel are to be completely modernized, and her sister ship, the Matsonia will be similarly treated. At this plant also are being built seven steel hull bucket dredges for gold mining, and a steel carfloat for the Santa Fe Railroad.



Launch of the Seattle fireboat Alki at the plant of the Pacific Coast Engineering Company, Oakland, California.

A steel hull dredge for the Hawaiian Dredging Company was built at the Oakland plant of the Pacific Coast Engineering Company and delivered during the year.

At the Seattle plant of Todd Dry Docks, Inc., a very extensive rebuilding job is under way on the former navy hospital ship Comfort, which is soon to reappear as the Atlantic coastwise liner Havana.

Winslow Marine Railway and Shipbuilding Company, pioneer in ship repair work on Puget Sound, reports a fairly busy year. Its marine railway handles vessels up to 4000 tons, and is backed by an equipment of dock, shops and ma-

Our illustration shows the shipyard and drydock plant of the Prince Rupert Drydock & Shipyard at Prince Rupert, British Columbia. Prince Rupert is on practically the same latitude as Eskimo Bay, Labrador, yet its harbor is open all year round and neither the drydock nor the shipbuilding ways suffer any inconvenience from ice conditions.

Here is shown the plant of the Craig Shipbuilding Company on the inner harbor at Long Beach, California. This plant is thoroughly equipped for building, repairing, overhauling and drydocking ships up to 300 feet length and 3000 tons weight.

chinery which insures prompt and efficient work in all classes of repairs to steel or wooden hull.

Prince Rupert Drydock and Shipyard has a thoroughly modern plant for repairs and building, either in wood or steel. This is perhaps the most northern plant of its class in America. On the same latitude as North Labrador, it nevertheless is free from ice the year round and the plant is in much demand for voyage and emergency repairs on all classes of craft.

Jumping 1500 miles south, we get report from the Craig Shipbuilding Company at Long Beach. This dock can handle ships up to 300 feet length and 3000 tons weight, and has been fairly busy this past year. The largest job handled was the steamship Samoa, damaged in a collision. This was a $40,000 job, and was dispatched in fifteen days. At present this yard is busy on a complete overhaul of the motorship Mazatlan.

Enough is displayed here to show that the shipbuilding and repair plant of the Pacific Coast is a live, going concern. It covers a lot of territory and displays ability and efficiency of high order in doing so. Including the wooden boat building establishments, shipbuilding on the Pacific Coast is responsible for the present continuous employment of approximately 15,000 men, with a monthly payroll of about 2½ million dollars. This payroll and this industry need encouragement. With cooperation between Pacific Coast shipowners, Pacific Coast civic bodies, and Pacific Coast politicians, the personnel and payroll of this industry might easily be increased 50 per cent and perhaps doubled with constructive and lasting benefit to each factor mentioned. No other industry spreads so great a proportion of its gross receipts among wage earners as does shipbuilding, and a large body of constantly employed wage earners forms the best basis for community prosperity.

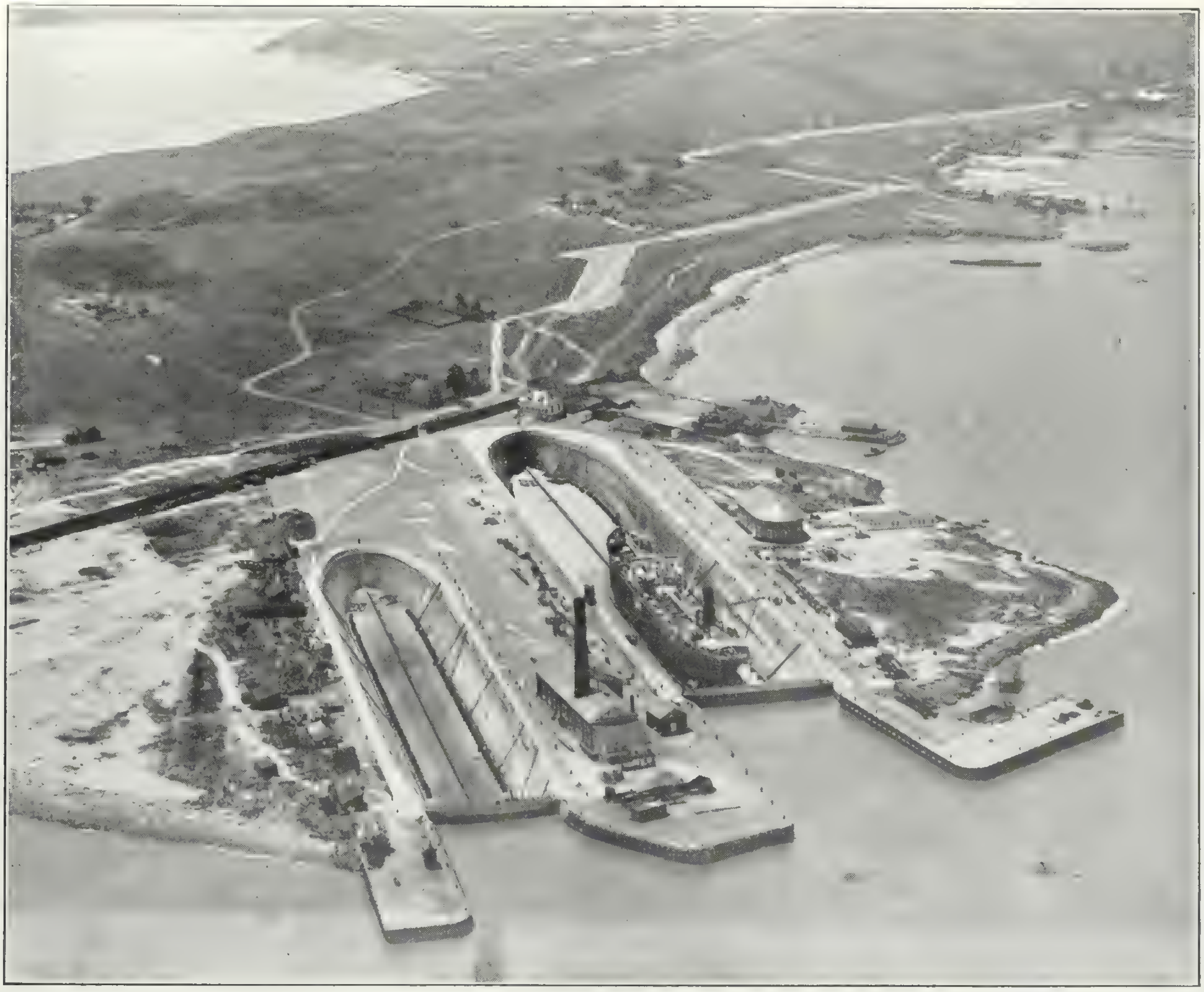
Concerted effort should be made to bring more Shipping Board conversion work, more naval work, more Coast Guard work, and more lightship work to Pacific Coast yards. Plans of Pacific Coast shipbuilders to convert existing Pacific Coast ships to more economical propulsion methods should be studied with more intelligent attention.

Chambers of commerce and development leagues that are spending large sums to attract new industrial payrolls to the Pacific Coast might well give some thought toward pulling in some more work for industries already established. Several large orders for new Pacific Coast vessels during the past few years have been placed with Atlantic Coast yards, and even with European shipbuilders. Cooperative action would undoubtedly have kept much of this work at home. Even Uncle Sam, when he wants shallow draft gunboats for Yangtse patrol, has them built in Chinese shipyards at Shanghai, when he could as easily and probably more expeditiously have had them fabricated on the Pacific Coast and shipped out. Pacific Coast shipyards were fabricating steel boats for Chinese and Siberian rivers over thirty years ago.

We do not wish to appear critical, but we know there is a decided lack of interest in this important question of cooperation with already established industries. The published figures issued last year by the San Francisco Chamber of Commerce setting forth the industries of the San Francisco Bay region failed to mention Steel Shipbuilding. When this omission was pointed out, it was maintained that "Steel shipbuilding ended here with the close of the Emergency Fleet Corporation building program." This in spite of the fact that for the period covered by the published tables, there were employed at steel shipbuilding and repair in San Francisco and the East Bay cities alone over 7500 men.

Shipbuilding means business expansion, port development, and home building, community betterment. Let's all get busy and

Some of the heavy crane equipment available for ship repairs on San Francisco Bay.



The Hunter's Point Docks of the Bethlehem Shipbuilding Corporation, Ltd., at San Francisco. The large dock on the right is the largest commercial graving dock in the United States and is capable of taking any vessel afloat at the present time. The giant airplane carrier Saratoga will be docked here on her initial visit to San Francisco in the spring of 1928.

boost this great industry, for by so doing we increase our own prosperity as well as that of our city, our state, and our nation.

With little prospect during the coming year for large shipbuilding yards, the small boat building business is looking forward to a rapid expansion in both wood and steel construction. Heretofore practically all steel yacht building has been carried on in Atlantic Coast yards and in Europe, but the lower overhead in some of the smaller Pacific Coast yards and the favorable conditions for year-round work is gradually making an impression on Pacific Coast yacht owners. Several large steel yachts for Pacific Coast owners are now being planned.

Another important outlet for the boat builder is the trend toward larger fishing boats to accommodate the ever increasing fshing industry on the Pacific Coast. It is quite possible that some of the fishing firms may, in the near future, consider steel as material for their fishing boats.

H. F. Alexander Exide Equipped

ONE of the most important safeguards in connection with emergency at sea is insurance of emergency running lights, emergency current for radio equipment and for lighting passageways sufficiently to prevent panic among passengers. So important is this considered that all passenger vessels under American registry are required to carry equipment which will automatically pick up the ship's lighting load on emergency circuits in the event of the flooding of the engine room and the auxiliary generating sets. This equipment is usually in the nature of a storage battery of sufficient capacity to pick up and maintain this load until the emergency internal combustion engine driven generating set can be gotten up to full power and tied in on the circuit.

The H. F. Alexander, crack passenger liner of the Pacific Steamship Company, has recently installed an Exide 60 Type MVA-9 storage battery of a design made especially for this service of radio and lighting emergency on shipboard. The discharge rating of this battery is 140 ampere hours at an average of 115 volts. This battery replaced a battery of another make.

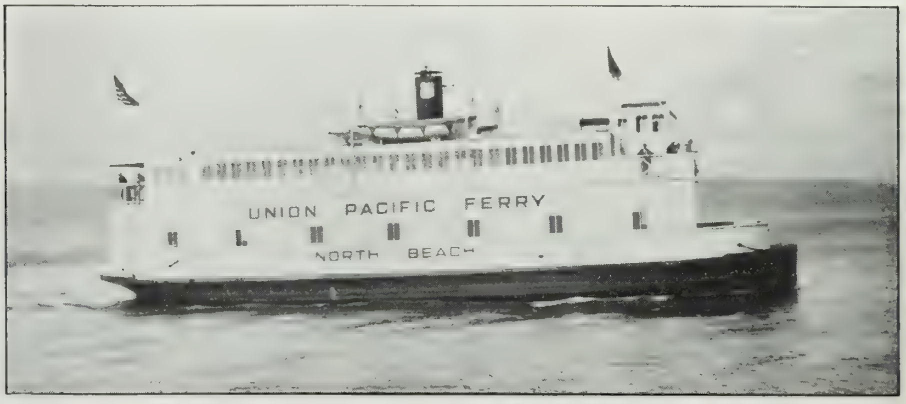
The Sperry gyroscopic compass on the H. F. Alexander is another improved piece of equipment which adds greatly to the economy and safety of navigation. Power for the master compass is provided by a 36-LX-5 Exide battery, which floats on the circuit from a motor generator set as a source of power. It is claimed that a good lead battery is the only type that will float on a power line successfully.

The Electric Storage Battery Company of Philadelphia, manufacturers of Exide batteries, are justly proud of the fact that this passenger liner, the speediest and most luxuriously equipped coastwise vessel in America, is completely Exide equipped.

Pacific Workboat Builders

In the September, October, and November issues of Pacific Marine Review there appeared a brief running comment on the work of the boat builders of Washington and British Columbia, in the Puget Sound region. We are here continuing this comment covering the work of the Columbia River, San Francisco Bay sections. In January and February this department will be largely devoted to southern California boat builders.

The boat building business on the Pacific Coast has been fairly prosperous and is expanding as the demands of the fishing and freight transportation business tend toward increasing size, power, and speed for the floating equipment. This progress has become so marked that several of the larger shipyards have equipped themselves to take care of this class of business.

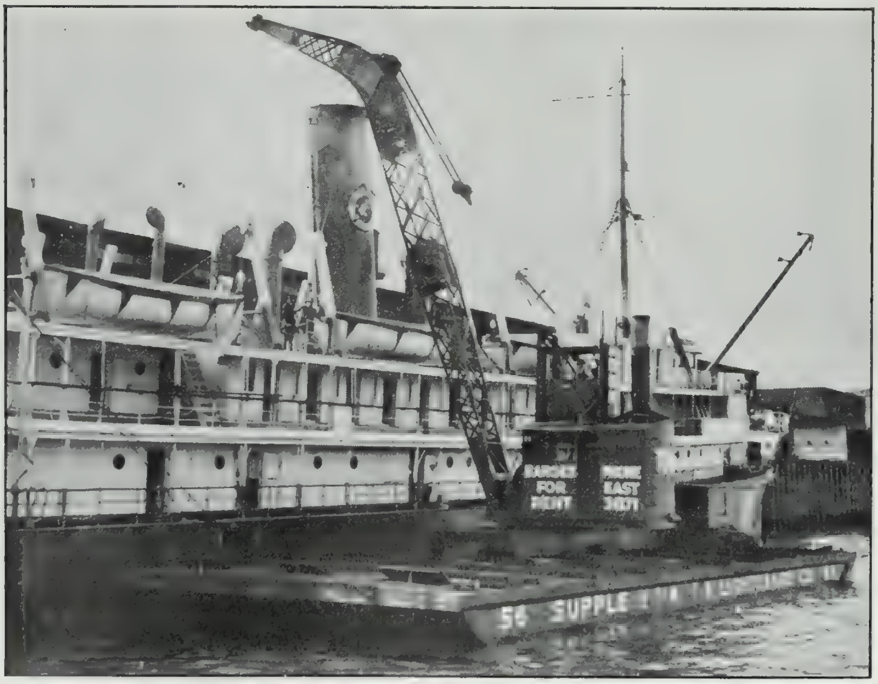


The Columbia River ferryboat North Beach built at the Matthews shipyard, Portland, and propelled by 200-horsepower Washington-Estep diesel engines.

Portland Notes

G. F. Matthew's shipyard at the foot of McKenna street, Portland, was established in 1920, Mr. Matthews coming from Hoquiam, Washington, where he had formerly operated a shipyard, building several vessels during war time. The yard is well equipped with ways, or "side haul" cradle, on which boats to 400 tons can be pulled up for repair or painting. A complete woodworking mill and machine and blacksmith shops are operated. At this yard was built the Astoria-Illwaco ferryboat North Beach for the Union Pacific Railroad. She is 115 feet length, 37 feet 6 inches beam, by 10 feet depth. She is of the enclosed type of deck house, giving good shelter to vehicles, of which she can carry nearly one hundred. She is propelled by a Washington-Estep diesel of 200 horsepower, and makes about ten knots. Besides the construction of this vessel, Matthews has had a busy season on repair work and general overhauling. At the present time the ways are being used to build the two steel fireboat hulls for the City of Portland.

Shaver Towboat Co., of Portland is having the high pressure engines of its stern-wheel steamer Henderson made compound. Low pressure cylinders with jet condensers are to be fitted. It is not expected that the power will be materially increased, but better fuel economy will result. The work of remodeling the engines is being done by Shaver, Thayer & Gully, Portland. The keen competition of diesel driven craft has necessitated adopting more saving of fuel methods, and the Henderson is one of the changes made in the race for survival of steam.



Derrick barge No. 56 of the Supple and Martin Lighterage Company, Portland.

Supple and Martin, Linnton, Oregon, besides doing a general repair business on hulls, are also engaged in barge and lighterage activities, building their own equipment as needed. One of their latest craft for this is the derrick barge No. 56, which easily handles 50-ton lifts. Besides this sturdy adjunct to their fleet, the workboat Mahony, Fairbanks-Morse diesel driven, was built at the yard for towing service. Business is reported good by the firm, and the yard is at present busy on the construction of a new wooden ferryboat, the Multnomah, designed by W. F. Gildner for the State Highway Commission. Plans and a description of this vessel will be found on Page 560 of this issue of Pacific Marine Review.

J. H. Johnston, the well-known designer of propellers, has been kept busy the past season. Among many other jobs he has built the propellers for the new ferryboat for the St. John's run. He has also lately turned out a bronze wheel for the ferryboat North Beach, of the three-bladed type. It is a 70½ inches diameter with a weight of 879 pounds, and is designed to make 280 revolutions per minute.

San Francisco Bay Boatyards

Anderson & Cristofani at Hunter's Point, San Francisco, have during the past twelve months built eight fishing boats for Monterey of lengths from 44 to 46 feet, the Dorothy Badger, a 55-ft. workboat, the ocean-going motor vessel Viosca, and now have on the ways a hull building for Captain J. Crevello, 46 feet long, 13½ feet beam, and 5 foot draft. She will be engined with a 55-horsepower Atlas-Imperial diesel engine. A 45-foot fish barge is also under construction. The motor yachts Valkyrie and Chow were turned out from this yard during the year. Besides the new work repairs have been made on many of the workboat fleet, and the ways at the yard were occupied steadily.

Bruer & Siemer, Hunter's Point, San Francisco, who specialize in repair work only, have had their hauling out ways kept going, and there has been but a very few days that one or more of the ways has not been occupied by bay craft, either for repairs or painting.

W. F. Stone & Son, at Oakland, turned out the big Arctic Ocean cruiser yacht Northern Light during the past year, which was the outstanding job. But besides this vessel there were built at the yard the workboat Crowley 23, the power yacht Maraquita, two auxiliary yachts of 55 feet each, the Aloha and the Noname, and several small boats. Repairs on yachts and workboats have also been extensive, and taken all through a very fair year's business has been done.

Robertson's Shipyard, Alameda, built the A. E. Williams, one of the most powerful and heavy workboats on San Francisco Bay. This craft, powered by a Fairbanks-Morse diesel engine, has proved herself to be very fine addition to the Harbor Tug & Barge Company's fleet. Robertson also built the Edwards dredge, two big barges for the Union Fish Company, and three for the American Dredging Company, and a gold dredge for South America. Besides this work the yard has constructed for its own use a fine floating dock capable of taking vessels of 600 tons. The site of this yard has been moved to above Fruitvale Bridge. The new site is in every way admirable, and Mr. Robertson and his son Milton feel that they will obtain a fair share of work within the yard's capacities.

George W. Kneass Company, Hunter's Point, San Francisco, has built several craft for Northern Alaska waters, barges for Central American trade, a workboat for South America, small boats in quantities, with a very good run of repair work.

John Twigg & Sons, San Francisco, one of the oldest yards on the bay, and builder of the famous cruiser yacht K'Thanga, is building three surf boats for the United States Light House Service. These are of very heavy and staunch construction. Frames of the best bending oak, all copper fastened, and planking of carefully selected timber insure a fine job for the hardy men of the sea who risk their lives in these little craft visiting stations along the coast from Mexico to Alaska. A diesel-engined workboat to the order of W. R. Grace & Company for South America was also launched from Twigg's yard the past season, besides many smaller craft.

The tug A. E. Williams of the Harbor Tug and Barge Company, Oakland, California, built by Robertson's Shipyard and powered with Fairbanks-Morse diesel engine.

Wm. Cryer & Son, Oakland, have had a very good year, turning out some very fine workboats and yachts. Three of the former craft were for Northern waters, and exceptionally well-built to stand up to the heavy duty exacted of them in the salmon fishing business. In addition to these, several cruiser yachts of special type were built, together with a big run of repair work and reconstruction business.

A newly designed cruiser has been turned out recently by this yard, and it is intended to make a stock pattern of it. The design is particularly well worked out, the hull being 30 feet length by 8 feet beam and 2½ feet draft. They will be engined with a Gray marine motor of 25 horsepower, self starting, and operated the same as an automobile engine.

The Madden & Lewis yard at Sausalito built the Morgensen yacht lately and she has proved to be a fine addition to the pleasure fleet of San Francisco Bay. In addition to several other craft, the yard has built many small boats, repaired most of the yacht fleet at Sausalito, and, in fact, has done very well the past season.

Fulton's Yard at Antioch has done a very good business during the past season, having launched several able workboats for the Delta district. The Rio Vista Towing and Lighterage Company replaced one of their workboats unfortunately burned, and another will probably soon be ordered from the same builder. Besides new work, Fulton has had a fine run of repairs, the ways and shops being kept busy most of the time.

The yard of the **Crowley Launch & Tugboat Company,** Oakland, concentrates chiefly on repairs to the Crowley fleet of tugs and barges, though the ways often are used by outside parties and have been kept busy at hauling out hulls of all kinds. The rebuilding of the gas powered boat Castro, formerly a naval craft, has kept the yard force occupied lately. The old engines were taken out and Pacific-Werkspoor diesels of 250 horsepower have been installed. Steel deck houses have been added, and the boat, now known as Crowley 23, is a staunch and powerful addition to the company's fleet.

Yacht Samona in Mexican Waters

THE well known motor yacht Samona, owned by W. J. Hole, of Los Angeles, left recently for her annual 3000-mile fall cruise along the lower Mexican coast, where Mr. Hole expects to secure additional interesting specimens of large game fish.

We recently announced in these columns, conversion of the Samona from triple to twin screw, and the installation of two Foos 8-cylinder diesel engines. Various trips proved that the new propellers were undersized and that additional speed could be obtained by larger wheels. This was done and wheels of six inches larger diameter substituted.

Trial trips off San Pedro, clocked by Captain Seaholm of the yacht, showed speeds of 14.27 knots at 580 revolutions per minute, which, the Foos organization claims, will make the Samona the fastest diesel motor yacht on the Pacific Coast. Revolutions per minute of 580 proved to be a very satisfactory cruising speed. The Foos engines, being new, were not opened up, but from the results shown the operators expect to turn up speeds exceeding all guarantees. This extended cruise, in exceptionally warm waters, should prove beyond any doubt the efficiency of high speed diesel engines for marine use.

These Foos type "L" engines are cold starting, 4-cycle, solid-injecstroke, and develop 260 brake horse power at 600 revolutions per minute, and 400 brake horse power at tion, full diesels, 8½ bore by 11 900 revolutions per minute, claimed to be the first American high speed, full diesel engines on the market. They are totally enclosed, with force feed lubrication, overhead valves, counterbalanced crank shaft, together with many other interesting features, and are ideal for marine use.

For yachts or work boats desiring a slower propeller speed, a reduction gear enables the type "L" to operate with propeller speeds as low as 150 revolutions per minute, thereby virtually equalling steam propulsion.

Garvey & Palmer, Inc., Pacific Coast distributors, report they are now delivering a number of Foos type "L" diesels for both marine and stationary duty at various Pacific Coast points.

Skoda Shipbuilding Material

THE famous Skoda Works at Prague, Czecho-Slovakia, have for many years made a specialty of heavy forgings and castings in iron and steel, copper, brass, and bronze. An interesting catalog just issued describes and illustrates these products.

Skoda is prepared to comply with any special specifications or to follow accurately the requirements of any of the national classification societies or of boards of trade or inspection services.

Stems, stern posts, propeller brackets, bow or stern rudders, propellers, contra-propellers, dredger parts, anchors, propeller shafts, line shafts, thrust shafts, crank shafts, engine parts, turbine casings, and rotors, gear transmissions, capstans, windlasses, steering engines, pumps, anchor and boat hoists, refrigeration machines, heating and ventilating equipment.

Skoda has turned out individual pieces of weights up to:—iron castings, 85 tons; steel castings, 80 tons; steel ingots, 110 tons; steel forgings, 75 tons; and bronze castings, 3 tons.

Sterling Electric Motors, Inc., has been incorporated for $200,000 to engage in the manufacture of electric motors. The incorporators are Carl E. Johnson, Earl Mendenhall, Allen A. Adams, J. M. Sharp, Horance S. Walling, all of Los Angeles.

IMPORTANT BOATYARD PRODUCTS.

At right is view of the boat building yard of Anderson & Cristofani, Hunter's Point, San Francisco, one of the busiest plants for the construction of workboats and yachts on San Francisco Bay.

Below are shown views of two recent products of this yard. On the left is the powerful tug Dorothy Badger, 55 feet long, powered with two 65-horsepower Atlas-Imperial diesels. At right is the sturdy passenger and freight boat Viosca, with a 110-horsepower Union diesel, for Rocholl Ruffo of La Paz, Mexico.

European Inland Waterways as Factors In Port Development

By Norman F. Titus, Chief, Transportation Division,
Bureau of Foreign and Domestic Commerce.

THE development of our inland waterways is a matter of supreme importance to the United States. Even a brief survey of our economic status proves this point most convincingly. Our Secretary of Commerce, Herbert Hoover, has called attention repeatedly to the underlying causes which emphasize the importance of inland waterways. In a notable speech at Kansas City, in 1925, he said, "Of these (causes) the most vital are the competitive difficulties into which our Middle Western agriculture has been thrown by the shifting economic currents resulting from the war, and a great measure of permanent relief can be given to it through cheaper transportation. But there are involved in this question other great national problems. There is high need of better distribution of our population in relief of the increasing congestion of our seaboard states. We must plan and provide greatly increased transportation facilities for the forty millions of added population that we must serve within the next quarter of a century." He further stated, "Already our great railway gateways and terminals are showing signs of congestion. Our traffic in 25 years has grown from 114 billion ton miles to 388 billion ton miles, or tripled. At a much less rate of increase we must within another quarter of a century provide for expansion in facilities to handle at least double what we are moving today." His prophetic vision has since been corroborated in a striking manner, for in 1926 the revenue mileage of our railroads had increased to 444 billion ton miles—a 42 per cent increase since 1921, or about double his conservative estimate.

In this life, when we face new issues, it is the part of wisdom first to scrutinize the activities of others to determine whether or not their experience offers anything of value. The engineer working in the remote places of the earth frequently meets unusual conditions —in one place the construction of harbor works without stone or in another the building of a railroad on a glacial bed. Invariably he notes carefully the efforts of other engineers in solving these kinds of problems.

In the matter of inland waterways, we may profit, perhaps, by foreign experience. In Europe inland waterways have been highly developed and, according to its own testimony, have been satisfyingly successful. Let us persue its book of experience to see if there is aught that will aid or assist us in our pressing problems.

The Port a Transfer Point

In surveying the European field, we find abundant proof of that fundamental principle of transportation that a port is not the source of traffic, but, in reality, is mainly a transfer point between different systems of transportation. Here the inland carrier, either rail or water, exchanges freight with the ocean carrier, whether coastwise or offshore, or the ocean carriers can exchange with each other. European ports also exemplify the truth that the great ports of the world are located generally on rivers. Just here we discover in their operation a radical difference from American practice. In America, the hinterland, which is the source of the port's traffic, is served largely by railroads; in Europe, the great ports use the rivers on which they are located as the chief mediums of transportation with their hinterland. Such is the case of Dunkirk, Havre, and Rouen in France, a considerable part of whose inland traffic is carried by water. Such, also, is the case at Antwerp in Belgium, at Hamburg and Bremen in Germany, and at Rotterdam in Holland, the latter's traffic coming chiefly from the regulated course of the Rhine. In all fairness, however, it should be pointed out that there are examples of very large European ports which enjoy remarkable prosperity though connected with their hinterland by rail only. Such is the case of Genoa, in Italy, whose annual traffic exceeds eight million tons; and such, also is the case of Marseilles, whose traffic totals seven and a half million tons, of which less than 7 per cent is received from the Rhone. In Europe, it is pointed out that these latter ports are successful in spite of their handicap in not having the highest type of inland waterway service; the strikingly successful ports are those using their inland waterways to the utmost.

Admittedly, water transportation is much cheaper than rail transportation; Europe has exemplified the economic cycle introduced by cheap transportaion. Great industrial centers have been built up through the availability of cheap raw materials at the factories. Furthermore, the markets of these factories have been widened because of the low cost of production. Many a German city, as, for instance, Duisberg, Ruhrort, Mannheim, Frankfort, or Dusseldorf, has become a great manufacturing center because of the inland waterways. It follows, inevitably, that cheap transportation by water for low grade raw materials at any point will make industries thrive at that location. As a corollary to this situation, all forms of transportation will benefit through the increased traffic occasioned by the distribution of the finished products.

One of the most interesting phases of the story of European inland waterways is the river port competition that has sprung into existence. These river ports have expended huge sums on terminal facilities, which have supplemented the cheap water transportation, so that waterborne freight is transported at an inconceivably low figure. Thus it is that all of these factors tend toward a concentration of industries in these regions and these industries furnish the volume of traffic that makes possible the astonishing tonnage movement on European waterways.

The Rhine System

In examining the details of the waterways of Europe, the Rhine system is, undoubtedly, the most striking; it illustrates very clearly the influence of waterways on port development. Abundant source material is found in the reports of the German, Dutch, and Belgian railways and also of the century old Central Commission for Rhine Navigation with head quarters at Strasbourg. These reports disclose the following situation:

Coal

1. Downstream—

To	By	Tonnage 1913*	Tonnage 1925*
Netherlands	Rhine	7,167,603	12,839,044
	Railway	4,584,861	1,242,175
	Total—	11,752,464	14,081,219

Belgium	Rhine	4,596,971	4,280,409
	Railway	2,900,065	1,580,690
	Total—	7,497,036	5,861,099
Total Both Countries		19,249,500	19,942,318

*Figures are in metric tons (2200 pounds each.)

These figures indicate that from 1913 to 1925 the increase in the total traffic was very slight, yet the proportion carried by water increased from 61 per cent to 86 per cent.

II. Upstream—

a. Waterways

	Tons
1913 Upper Rhine, Middle Rhine, and Main	9,600,000.
1925 Upper Rhine, Middle Rhine, and Main	9,400,000.

b. Railways

The situation is very complex; however a few generalizations may be made:

1. Swiss traffic has diminished, more so by waterway than by rail.
2. The Baden and Wurttemberg water-borne traffic has decreased 13.5 per cent, whereas the rail-only traffic has risen 352 per cent, and the total traffic by 12 per cent.

The deductions concerning this up-stream coal traffic will be combined with those of other commodities for generalization later.

Iron Ore

The term iron ore includes manganese ore, haematite, and slag for the metal industry, but not pyrites, and it represents the inward movement through the Netherlands and Belgium.

Waterway traffic—1913 8,725,000 tons.
1925 8,100,000 tons.

This represents a 7 per cent decrease in 1925 as compared with 1913, although waterway traffic through Emden and the Ems canal, accounts for this difference to a large extent.

Railway traffic—1913 271,798 tons.
1925 21,108 tons.

From these figures it will be noticed that rail competition has nearly disappeared on this commodity.

Iron and Steel Manufactures

		Netherlands Ports	Belgium Ports	Total
1913—	Rhine	684,000	496,000	1,180,000 tons
	Railway	355,000	409,000	764,000 tons
	Total—	1,039,000	905,000	1,944,000 tons
1925—	Rhine	1,110,000	540,000	1,650,000 tons
	Railway	90,000	32,000	122,000 tons
	Total—	1,200,000	572,000	1,772,000 tons

Conclusions. In 1913—Water traffic 61.2 per cent
In 1925—Water traffic 93.1 per cent

These conclusions are highly significant for American port authorities since they indicate the trend toward water carriage, notwithstanding that time is a great factor in the delivery of much of this manufactured iron and steel.

Salt

Waterway traffic, 1913—103,378 tons; 1925—135,571 tons.

Increase 31.1 per cent.

Rail competition negligible.

Sugar

	1913	1925	Total
Rhine	176,650	230,758	407,408
Railways	218,050	206,148	424,198

Water traffic increased 30.6 per cent.

Rail traffic decreased 5.7 per cent.

Cereals and Cereal Products

	1913	1925
Total imports into Germany through all ports	7,560,000	3,972,000
By the Rhine	3,929,093	2,097,293
Rhine traffic	48 per cent	46 per cent

Rail traffic is negligible whenever water transportation is available.

As a factor in port development, it is interesting to note the foreign trade in other commodities of the Rhine region handled by waterways in 1925:

Wool	22.6 per cent
Jute, hemp, linen and other textiles	27.9 per cent
Porcelain and pottery	12.7 per cent
Glassware	39.8 per cent
Coffee, tea and cocoa	59.3 per cent
Paper and Paper products	72.6 per cent
Skins and raw hides	33.4 per cent
Raw tobacco	54.6 per cent
Lead	96.7 per cent
Zinc	97.1 per cent
Other base metals and base metal goods	85.8 per cent
Cement	81.6 per cent

A measure of the importance of the Rhine traffic can be obtained from the records of the Dutch customhouse at the German border at Lobith; these indicate that, in 1926, 29,775,400 tons moved inward and 12,223,795 tons outward. Averaging the results, we find that, in ten years, the movement of Rhine traffic had increased steadily so that in 1926 it was 50 per cent greater than in 1913.

Netherlands

In the Netherlands freight movement is accomplished generally by water; in fact, the annual reports show that the movement is 3½ times greater by water than by rail. This condition can be understood readily from the fact that Netherlands railroads are approximately 1500 kilometers while there are 27 rivers of 1000 kilometers and 270 canals and waterways of 3660 kilometers.

In 1926, all Dutch ports handled sea-going traffic of 49,171,692 metric tons and river and canal traffic of 47,796,576 metric tons. For Rotterdam, the traffic was 37,307,186 tons and 30,445,889 tons respectively. These figures show that in the Netherlands transportation by inland water routes is only slightly less in volume than that of seagoing traffic.

The reason for this preponderance of inland waterway traffic is found in the following particulars of a typical freight movement of a shipment of 100 kilos (220 pounds) from Rotterdam to Groningen, a distance of 225 kilometers (140 miles).

Express rail $2.50 delivered in 1 day.
Ordinary rail $1.20, delivered in 5 to 6 days.
Water $0.30, delivered in 3 days.

Belgium

The maritime status of Belgium is disclosed, to a very large extent by an examination of the activities of Antwerp, its chief port; in fact, its only port of major importance. The inland water transportation facilities connecting Antwerp with centers of consumption and distribution constitutes one of the most important factors contributing to its greatness as a port.

Antwerp not only serves the drainage basin of the river Scheldt and Lys, but also those of the Meuse, Sambre, and Rhine. These rivers are connected by canals which, in Belgium teriitory, have a length of 2370 kilometers (1473 miles.) The Rhine communicates with the Scheldt by means of the maritime canal of Hansweert. The Belgium government tows, free of charge, all canal vessels proceeding from Antwerp to Dortrecht and return. By doing this, Antwerp is enabled to get a large share of the Rhineland traffic.

According to the port authorities at Antwerp, 4020 inland vessels entered Antwerp during the month of July, 1927. During the first seven months of this year 25,230 inland vessels entered Antwerp; of this total all but 5300 were towed. The aggregate tonnage of the vessels entering Antwerp during this period was approximately 7,200,000 tons. During the same period, 25,259 inland vessels cleared from Antwerp, of which all but 5542 were towed. The aggregate tonnage of these vessels was approximately 7,000,000 tons.

The inland shipping of Antwerp may be compared with its ocean shipping by noting the fact that during the first seven months of 1927 arrivals of seagoing vessels amounted to 6649 of an aggregate tonnage of 13,511,793 tons. The figures showing departures are not available, but they may be estimated as being approximately the same. It will be noted, therefore, that the volume of inland shipping at Antwerp as compared with its ocean shipping represents, approximately, a one to two ratio.

The great object lesson to be deduced from Antwerp's experience is that cheapness of inland waterway transportation enables Antwerp to compete with even such distant ports as Genoa for the export and import trade of Switzerland, and the north of Italy.

Germany

We have already examined in some detail the Rhine traffic as an introduction to the consideration of inland waterway influence on the ports of the Netherlands and Belgium; however, we have now to consider the importance of inland waterway transportation in Germany as a whole and, especially, with reference to its greatest commercial city and its greatest port, namely, Hamburg.

The length of the inland waterways in operation in Germany is estimated at 3850 miles; it is estimated further that the inland waterways carry about 75 per cent of the bulk cargo, such as coal, ore, earths, timber, and building stones. There are approximately 132 more or less important inland waterway ports in Germany, All of which are equipped with extensive facilities for transshipment from barge to railroad and vice versa. The aggregate amount of goods handled on the German waterways in 1925 was 85.6 million tons.

The total length of all the navigable waterways in Germany is estimated to be about 8500 miles, of which about 3500 miles are included in the Weser, Ems, Rhine, and Danube systems. At the present time there is no waterway connecting Hamburg and the area served by this latter group of rivers, with the result that a part of the Central European cargo traffic is diverted elsewhere, or is handled by the railroads at a higher rate of freight. This fact is a highly significant one from the standpoint of our examination; it is also equally significant that Hamburg is fully aware of its deficiency in this respect and is taking steps to remedy it. To overcome this handicap, Hamburg is aiding in the promotion of what is know as the Hansa Canal, which will link the western part of the present Ems-Weser Canal with Hamburg. The combined waterways consisting of the Rhine-Herne Canal, the Dortmund-Ems Canal, the Ems-Weser Canal, and the Hansa Canal will then constitute the shortest waterway connection between Duisburg-Ruhrort on the Rhine and Hamburg. The chief intermediate transshipment centers will become Gelsenkirchen for the Ruhr district; for other districts, Muenster, Osnabrueck, and Bremen. The length of this canal will be about 120 miles; whereas, at present the distance, by shortest water route between Hamburg and the Ruhr is about 240 miles.

Concerning Hamburg's traffic, the following figures disclose the movement in 1913 and 1926:

Incoming Traffic

(Figures in Thousands of Tons)

	Sea-going	Inland water	Rail
1913	16,548	5,382	5,245
1926	11,041	4,966	8,495

Outgoing Traffic

	Sea-going	Inland water	Rail
1913	8,910	7,248	2,615
1926	10,870	3,343	2,774

From these data, we note that of the total incoming traffic which arrived at the port of Hamburg during 1926, 45 per cent. arrived by seagoing vessels, 20 per cent. by river craft, 35 per cent. by rail.

Other studies of Hamburg port data disclose that the average movement of merchandise arriving by river and canal craft has increased steadily since the termination of the war. Although there was an enormous increase of nearly 45 per cent. of merchandise arriving by river craft during 1926 as compared with 1925, the figures for 1926, nevertheless, are still approximately 8 per cent. less than those of 1913.

Of the out-going traffic from the port of Hamburg in 1926, 64 per cent. left by seagoing vessels, 20 per cent. by inland waterways, and 16 per cent. by rail. As with incoming traffic, the figures for freight leaving by river and canal craft show a steady increase for a number of years, but are still considerably below the figures for 1913, the traffic for 1926 being no less than 54 per cent. under those of 1913.

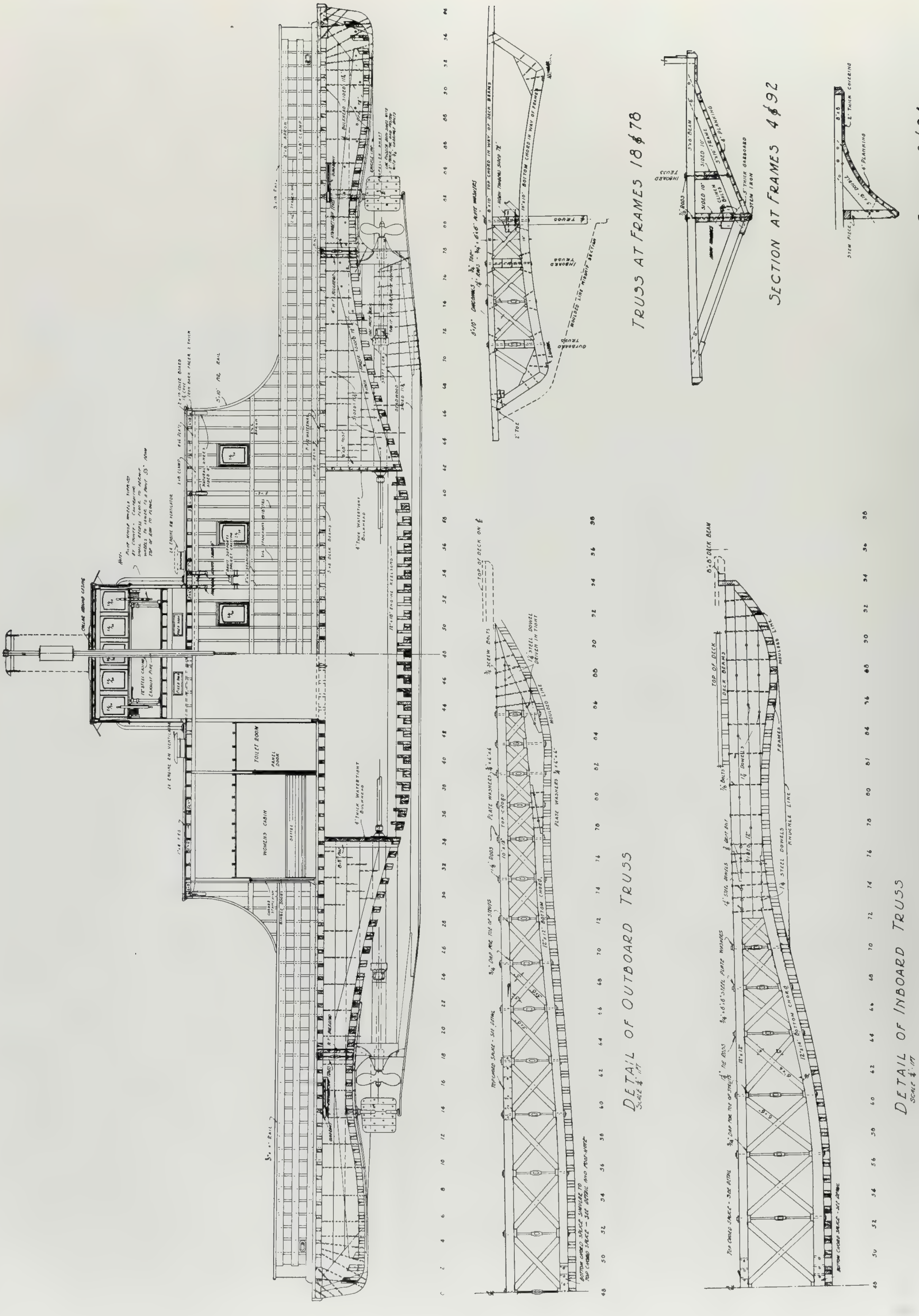
France

Turning to France, we find present the same influence on port development as has already been noted in the cases of the Netherlands, Belgium and Germany. The great lesson to be derived from France is the notable effect of a definite national waterway policy.

The inland transportation routes of France are the outgrowth of centuries of experience. After the Franco-Prussian War, however, France seriously set herself to evolve a definite waterway policy, recognized at that time as being indispensable. This resulted in the De Freycinet Commission which laid down the principles and policies which France has followed to this day. Very naturally, one of the great issues to be decided was the relation of the waterways to the railways. The way this was decided can best be expressed in the following words of M. de Freycinet set forth, in 1878, in his report to the President of the French Republic:

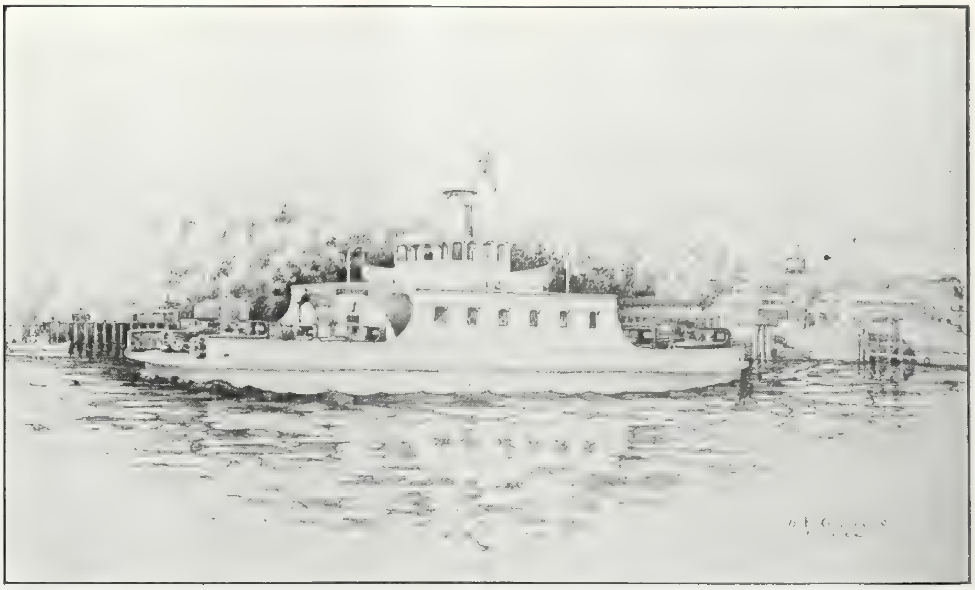
> "These navigable routes play an important role in the production of the wealth of the country. If one could believe for an instant that their usefulness is going to disappear and that they would soon yield entirely to the railways, this superficial impression would not long endure before an attentive examination of the facts. We recognize that navigable waterways and the railways are destined not to supplant one another but to complete one another.
>
> "Between them there is a natural division of attributes. The less cumbersome traffic goes to the railways, that which demands speed and regularity, which supports best the expenses of transportation; to the waterways go heavy freights and those of small value which cannot be moved from place to place except at low cost, which would give to the railways only an illusory remuneration and which would encumber them rather than nourish them.

(Continued on Page 42, Advertising Section.)



Inboard profile and details of trusses and frames of the shallow draft, double-screw motor vehicular ferryboat Multnomah.

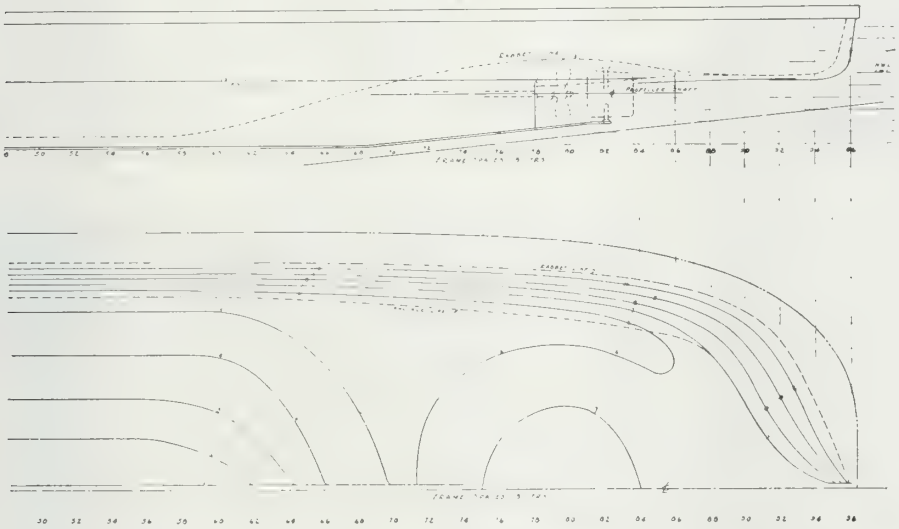
An Interesting Shallow Draft Ferryboat



The Multnomah as she will appear running into slip, from sketch by W. F. Gildner.

A NEW ferryboat for the Multnomah County Road Commissioners of Oregon is being built at Linnton by Supple & Martin. This vessel has been designed by W. F. Gildner, engineer, of Portland, Oregon, and will be ready for service before January 1, 1928. She is to be 145 feet length by 45 feet beam. Besides foot passengers she will carry 50 automobiles, and will ply across on the Willamette River at St. Johns. Her power will be an Atlas-Imperial diesel engine of 250 horsepower, arranged with clutches at each end so that the whole power of the engine can be concentrated on either screw, allowing the other to idle.

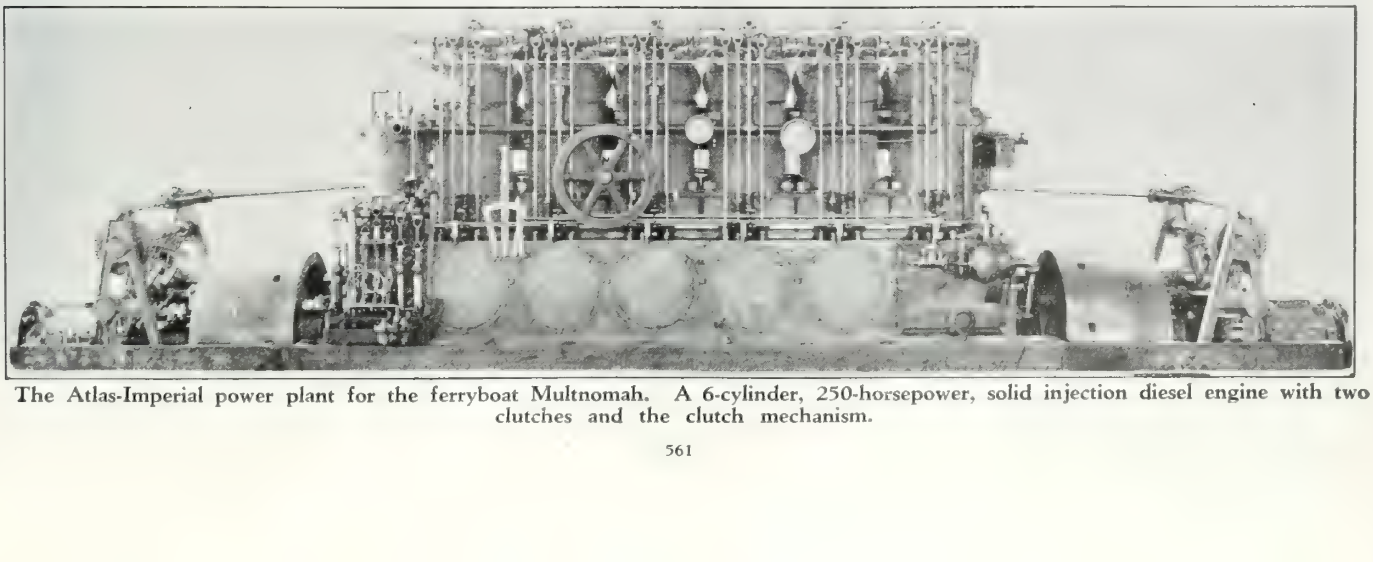
Reference to the drawings of the hull reproduced herewith show that the construction is strong and heavy, requiring shipbuilding ability of a high order, but the resources of the yard are able to cope with the problem.



Profile and developed lines in way of tunnel stern of the ferryboat Multnomah.

Existing conditions of present ferry slips, together with the great range between low and high water in the river made it imperative that a radically new design of hull be adopted. Also the ferryboat must be double-ended and capable of nosing up an incline of 10 per cent to bring the deck level with the raised land pontoon. The cutaway bows take care of this, as the draft is only 18 inches, increasing to 7 feet amidships. The propeller wheels are protected, also by this design, from drift wood and debris, a menace at some seasons of the year, the full tunnel construction forming a water-sealed pocket in which the screws and rudders operate.

Speed is in no way sacrificed by this peculiar build, as a cutwater bow and easy lines have been worked out. Five longitudinal bulkheads with heavy trussing and transverse trusses over tunnels insure solidity and strength of the whole hull. Hatches for inspection of rudders and propellers are also provided.



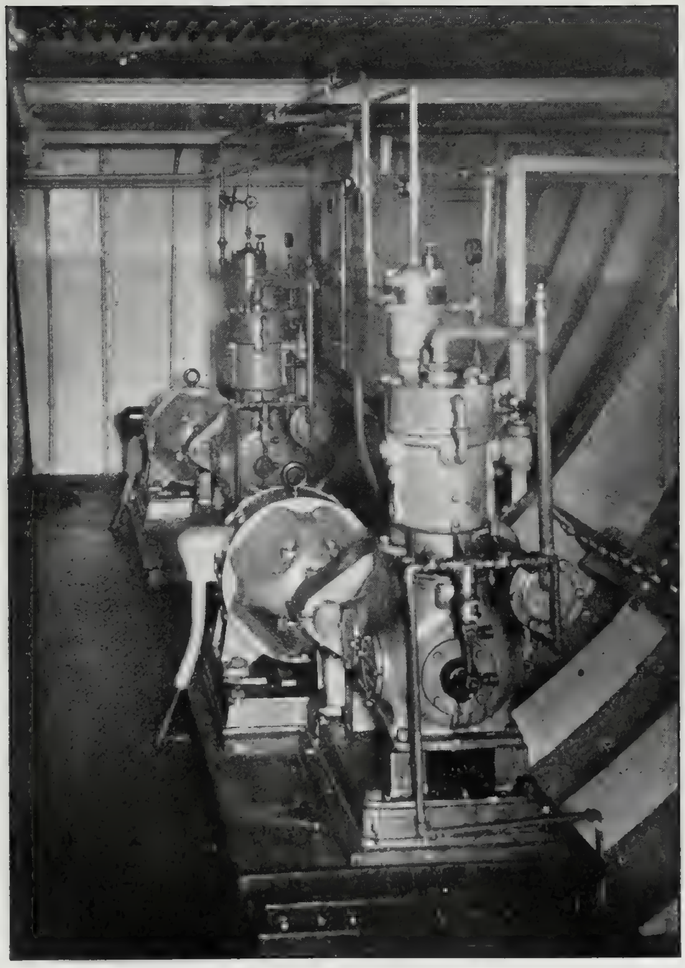
The Atlas-Imperial power plant for the ferryboat Multnomah. A 6-cylinder, 250-horsepower, solid injection diesel engine with two clutches and the clutch mechanism.

Southern Pacific Type Auto Ferries

Southern Pacific diesel-electric vehicular ferry Fresno.

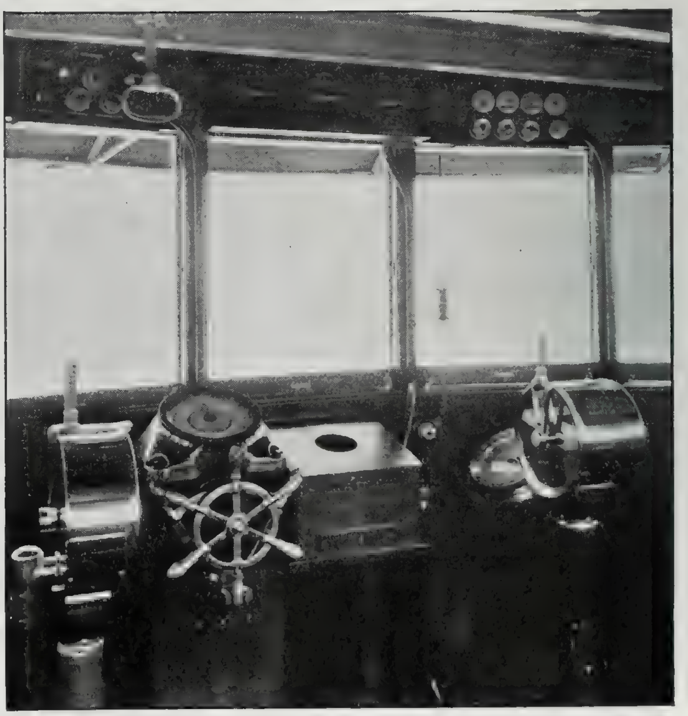
THE most notable Pacific Coast shipbuilding program and largest application of diesel-electric propulsion for delivery during 1927 was six steel hull vehicular ferryboats for the San Francisco Bay services of the Southern Pacific Company and the Northwestern Pacific Railroad. These six vessels, designed by the engineering department of the Southern Pacific Company, are all now in operation and are giving a good account of themselves as regards fuel economy and reliability of the propulsion machinery. Full description will be found in Pacific Marine Review for November 1926.

The power plant of each of these vessels consists of four Nelseco 6-cylinder, 4-cycle, single-acting, mechanical injection, full diesel engines of 15-inch bore by 22-inch stroke, each developing 450 horsepower at 230 revolutions per minute and each directly connected to a 275-kilowatt, 250-volt, shunt wound, separately excited, direct current generator, and, mounted on the same shaft, a 40-kilowatt 125-volt, compound-wound exciter. Four of the six vessels were electrically equipped by the General Electric Company and two by the Westinghouse Electric and Manufacturing Company. The Potrero Works of the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., built three of these ferryboats, The Moore Dry Dock Company built two, and the General Engineering and Drydock Company, one.



Electric motor driven Rix auxiliary compressor on diesel-electric ferryboat.

The engine room space on these ferryboats is divided into two parts by a thwartship bulkhead. Each part contains two of the diesel generating sets and one of the double-armature propulsion motors. Each of these motors develops 1250 horsepower at 130 revolutions per minute. Each of the engines is equipped with a pump assembly to take care of circulating water, lubricating oil, and fuel oil transfer. All of these pumps are of the plunger type and are mounted on one end of the main engines and driven directly therefrom. In ad-



Typical pilot house on Southern Pacifice diesel-electric ferryboat arranged for either direct pilot house control of propulsion motors or for engine room telegraph control.

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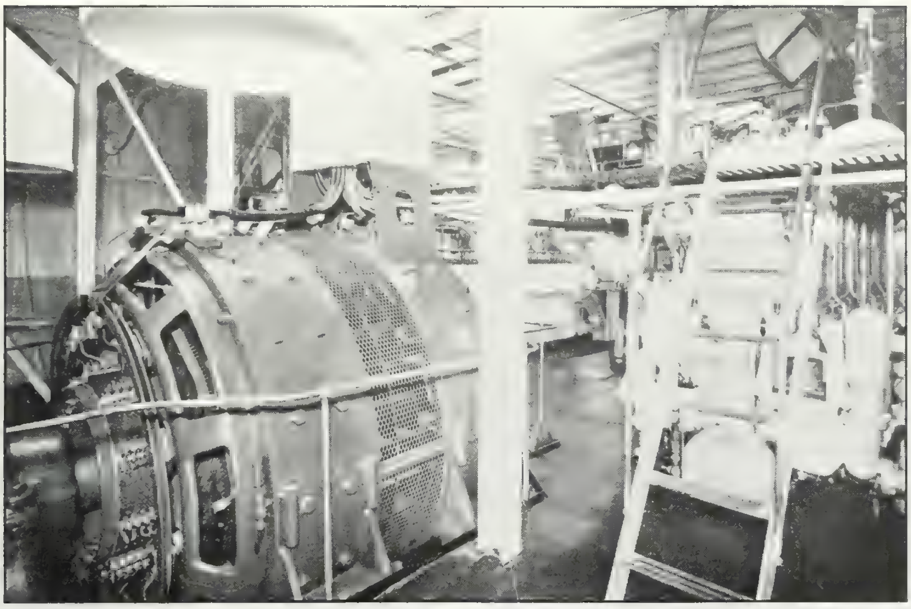
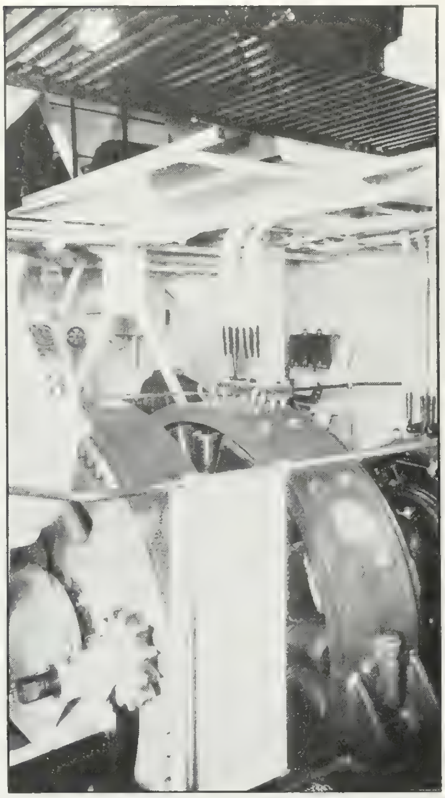


Engine room of the Southern Pacific ferryboat Stockton, showing close-up of one 1250-horsepower double-armature General Electric propulsion motor.



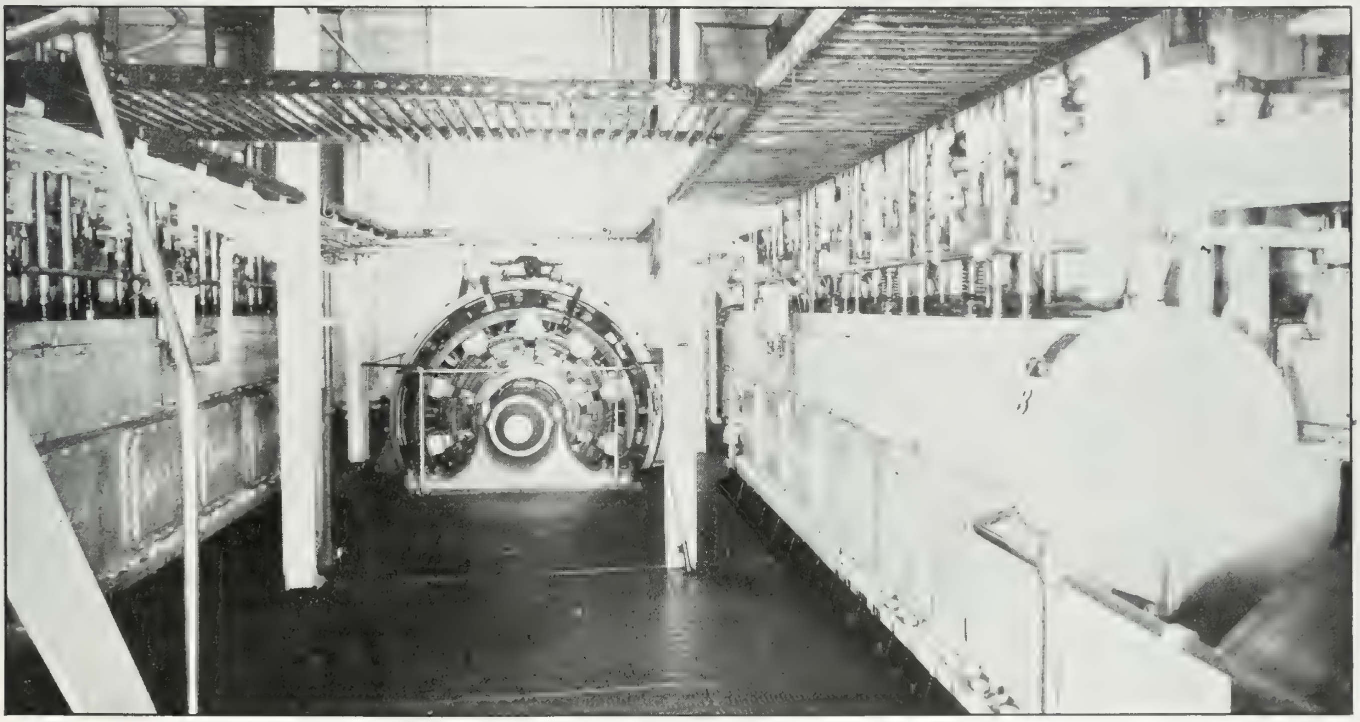
Close-up of one of the General Electric 270-kilowatt generators and 40 kilowatt exciter sets and the fly wheel and turning gear of the Nelseco engine.

dition to these regular service pumps on the engines, there is provided in each engine room for stand-by and emergency service Northern rotary motor drive pumps of approximately double the capacity of the engine pumps; so that these stand-by pumps can furnish circulating water, lubricating oil, and fuel oil to one or more of the engines in case of any casualty such as a sticking check valve putting the engine-driven pumps temporarily out of service.

It is noteworthy that not one of these six sister ferries has missed a scheduled trip since being placed in operation. As will be noted from the illustrations, there is ample working space in the engine room. Ventilation is by fresh air, brought down at the after and forward ends of two long, narrow hatchways and delivered practically over the motors and generators in each engine room. This air then sweeps through the engine room to the central transverse bulkhead and up and out through the stack.

The upper decks on these ferries furnish comfortable lounging rooms and lavatories for men and women, also wide, open promenades with ample outdoor seating. An excellent quick-meal restaurant service is maintained day and night.

Autoists can now cross the bay with comfort and prompt dispatch.



View in engine room of diesel-electric ferryboat showing two of the four 450-horsepower Nelesco diesel engines and an end view of one of the 1250-horsepower General Electric propulsion motors on the Southern Pacific ferry Stockton.

The Golden Type Auto Ferries

General Engineering, Ingersoll-Rand and Westinghouse Combine to Produce an Efficient Diesel-Electric Auto Ferry for the Golden Gate Ferry Company

The Golden Gate Ferry Company's diesel-electric vehicular ferryboat Golden Poppy, on regular service between the foot of Hyde Street, San Francisco, and the foot of University Avenue, Berkeley.

THE new automobile ferry service across San Francisco Bay from the foot of Hyde St., San Francisco, to the foot of University Avenue, at Berkeley, is a major improvement in transbay transportation, and the boats built for this run are very fine examples of modern, economical automobile carriers. This article, together with its illustrations, gives a good idea of the appearance of these boats and of their power plants. For a detailed description and drawings of hull, the reader is referred to Pacific Marine Review for November 1926.

The Golden Gate Ferry Company of San Francisco, under the capable direction of President A. C. Stewart, has operated ferry boats between San Francisco and Sausalito for five years. They were the pioneers in the application of diesel-electric propulsion to vessels of this type. Experience gained in that service was helpful in determining the type of boats most applicable to the new run. Three new vessels—the Golden Bear, the Golden Poppy, and the Golden Shore—were built, all being completed and placed in commission between June 1 and July 1, 1927. They are identical in size and construction, being of the latest design of wooden hull types. They were built by the General Engineering and Drydock Company at Alameda, California.

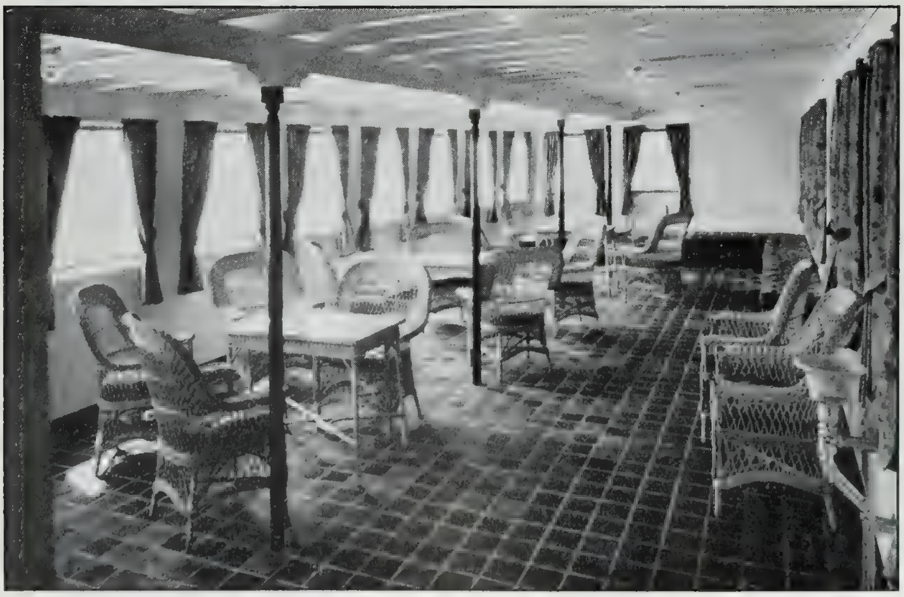
The time required for the trip is 17 minutes. Between the hours of 6 in the morning and 8 at night the interval between departures is 15 minutes, while for the rest of the night it is 30 minutes. During the day all the boats must be kept in service in order to maintain schedules, but at night two boats suffice. Each of the three boats is alternately out of service for 10 hours of the 24 for a period of two weeks. This means that over the entire year, each boat is operated on 24-hour service one-third of the time and on 14-hour service the balance of the time.

The boats are of diesel-electric drive. Each is fitted with three 14 by 19-inch, 6-cylinder, 400-horsepower engines. These are of the Ingersoll-Rand "PR" type. They are directly connected to Westinghouse generators and exciters, which convert the power to electric energy for driving the propulsion motor. The boats are equipped for pilot-house control. They are noiseless and free from vibration. The fourth unit, which is now under construction, is to be similar in all respects to the three now in service.

The engine room auxiliaries have elicited as much comment as the driving mechanism, owing to the convenience and flexibility of operation which they provide. The engine crews in particular, have expressed themselves as pleased with these facilities.

Two electrically-driven Ingersoll-Rand auxiliary compressors, a type 15 and a type 20, are provided. The piping from these machines to the two 3-foot by 9-foot air receivers is so arranged that both compressors can discharge into one receiver until the pressure is built up to 150 pounds. One compressor then automatically stops, while the other continues to operate until the receiver pressure is 300 pounds. With this arrangement, all three driving engines can be started from atmospheric pressure in less than 15 minutes.

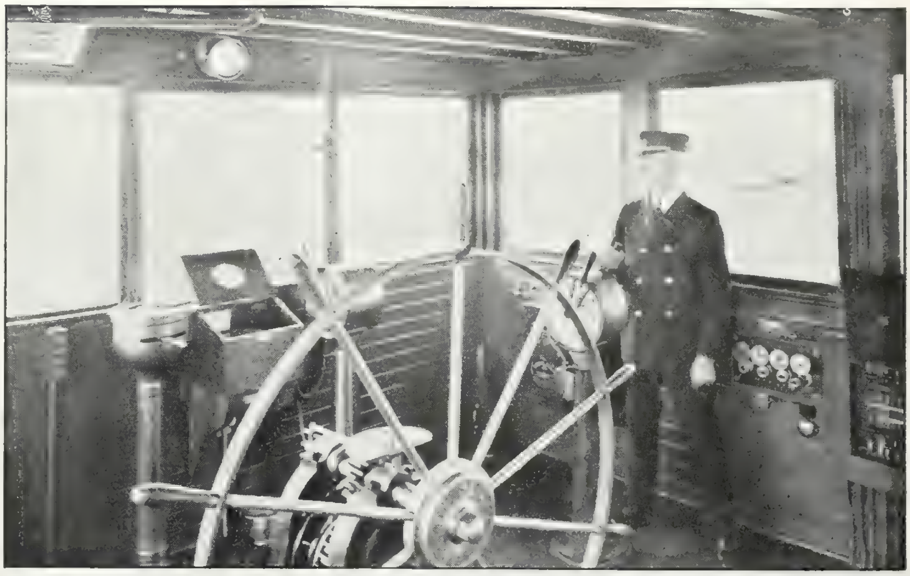
As soon as the engines are in operation, the second receiver is charged to 100 pounds pressure and then serves as storage capacity for blowing the whistle. One compressor automatically keeps the pressure within certain limits, starting up when it drops to 60 pounds and



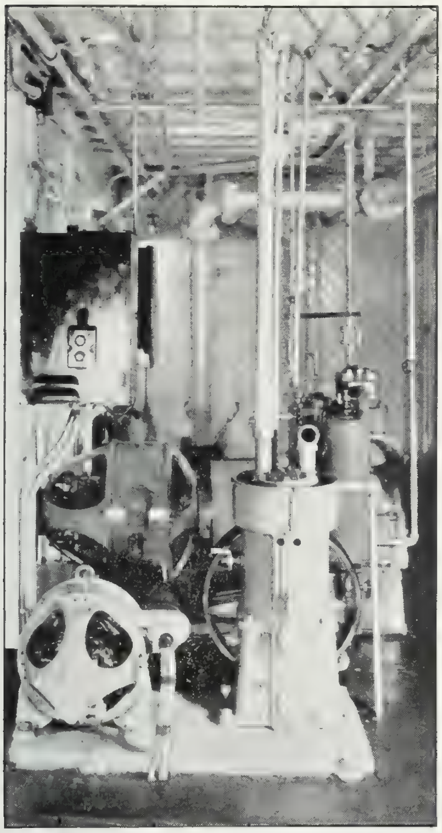
Ladies rest room, an attractive feature on the new Golden type auto ferries.

cutting off when it reaches 100 pounds.

If a boat is taken out of service for any reason, both receivers are charged to 300 pounds of pressure, thereby providing the required starting air for the engines when service is resumed. If these receivers should lose their air supply, emergency power for the compressors is available from a small auxiliary generating set.



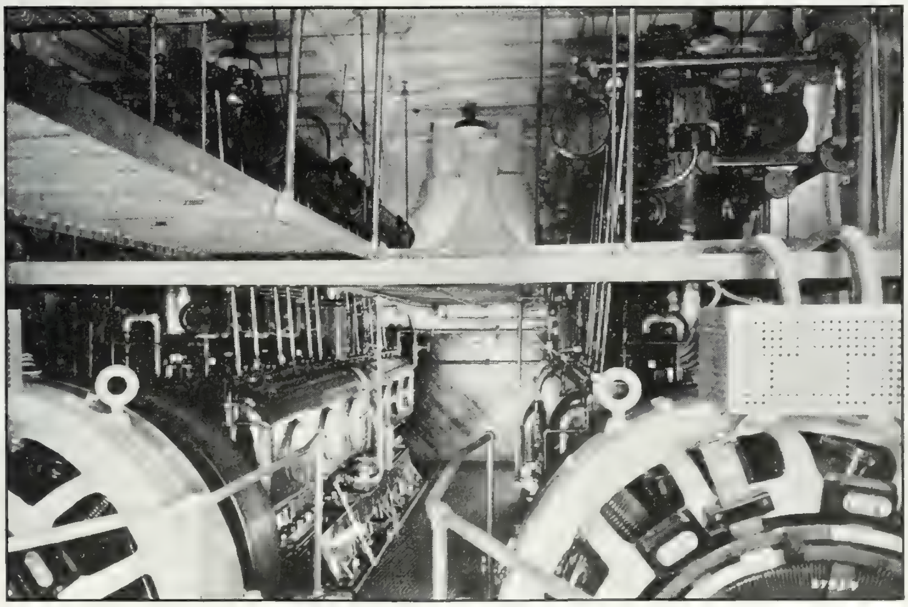
View in a pilot house of one of the Golden type diesel-electric diesel ferryboats showing Markey steerer and motor controls.



Electrically driven Ingersoll-Rand auxiliary compressors on Golden type auto ferries.

Since the oil engines employ the solid-fuel-injection principle they are free from the trouble sometimes encountered with air-injection engines, where difficulty is experienced in securing satisfactory small auxiliary compressors to furnish required air at 1000 pounds pressure.

The lubricating system also has met with the favor of the crews. Oil from the base of the engine is pumped through an oil strainer, then through oil coolers and back to the engine at a pressure of about 25 pounds. The circulating water pump has sufficient capacity to handle the water on all three engines. A duplicate unit is installed for stand-by service.



View in engine room of new Golden type auto ferries showing two of the three Ingersoll-Rand-Westinghouse diesel generating sets.

The three new ferries have been put into service under the supervision of C. C. Brown, chief engineer and assistant general manager of the owning company. He is well known in West Coast maritime circles for his ability to assemble engine room crews in a short space of time and to make of them harmonious groups.

So satisfactory to the Golden Gate Ferry Company has been the performance of this type of automobile ferryboat that an additional boat has been ordered and is now under construction at the Alameda plant of the General Engineering and Drydock Company, and this boat will be equipped with identical machinery to that installed on three already in operation.

A notable feature of the performance of these wooden ferries is the elimination of vibration. Automobilists on the Berkeley-San Francisco run who are fortunate enough to meet the new boats are continuously being surprised with the fact that they are moving across the bay without having had any sensation of starting and that they have arrived at the slip without any sensation of stopping.

The Ingersoll-Rand engines and the Westinghouse electrical equipment have functioned 100 per cent, and during a period of several months one of these boats was in practically continuous operation night and day, the generating sets not being stopped at any time, a record which speaks volumes for the careful engineering in design, construction, and installation of these power plants.

In the Engine Room

A Department Devoted to Marine Engineering from the Standpoint of the Operating Platform

At the Chief's Desk

By C. E. Milbury.

Let the Third Do It!

WHEN the third assistant comes down at eight bells, have him tear down the sanitary pump and renew the plunger packing. Sounds just like home doesn't it?

The third probably needs the experience. But isn't it possible that he at times gets a little too much experience? Who is watching the plant while he is working on watch? What if something happens while he is standing on his head somewhere beneath the floor plates?

Can the Chief rest easy knowing that the third is busily engaged on some overhaul job, while the watch oiler is being depended upon to look after things?

Is it fair to place the third, or in fact any other engineer, in a disadvantageous position and at the same time expect him to keep an eye on the department. In the event of serious breakdown or accident to machinery, what weight would his excuse hold before a board of inquiry that he was in the act of overhauling auxiliaries when the thing occurred?

These are some of the questions that arise, while the third is doing it. There are some chiefs who lose no time in assuming responsibility for the watch, and alertly pace the floor plates while the watch engineer is engaged. This procedure, in my mind, is highly commendable in the interests of mutual fair play.

Suction Through a Blank?

EIGHT ninety-degree bends in a suction line are considered by some inspectors to possess all the qualifications of a blank. Personally, I would prefer to call them ninety-degree angles of resistance, not that it sounds fancier, but it covers the ground more fully, for there are angles of resistance that are not actually bends in the generally understood sense.

A globe valve, for instance, while not a bend in the accepted sense, is nevertheless a ninety-degree angle of resistance.

Recently I observed on a tank vessel a suction line installed from the engine room after well to the line bilge pump, in which I counted no less than fourteen ninety-degree angles of resistance; some were forty-five's, some were tee's, and some were globe valves, the aggregate of which, however, totaled fourteen angles of ninety degrees. It was obvious that in this particular case all of these bends were necessary (except perhaps that gate valves could have been used in lieu of globe valves) due to the cluttered location of various other connections and physical obstructions that had to be cleared in running this line. But this suction line never worked. The line pump suffered its share of the blame, as did the possible existance of air leaks in the line itself.

I hope that the boys who were struggling with this line will chance to read this and requisition 30 feet of flexible 3-inch hose to weave in place of this monstrosity of trigonometry.

Metalitis

WE have often heard engineers refer to a certain engine as one that can be keyed up every trip but refuses to stay keyed; that after an overhaul wherein several buckets (more or less) of liners have been removed from her cross-heads and pin bearings, she leaves port running like a clock, but that within a few days she starts loosening up, sounding eventually like a battery of trip hammers.

Nine times out of ten an engine with this ailment is suffering from an aggravated case of **metalitis**, and a Brinell or a scleroscope test will indicate that the bearing metal involved is perhaps several degrees softer than that required by good engineering practice and is in all respects unsuited to the stresses and punishment that it is expected to withstand.

Too often a cross head or crank pin bearing is sent to the shop for remetalling, on a work order that may read something like this.

(Item)

> Remove to shop, remetal H.P. cross-head brasses, and I.P. crank pin brasses, return on board, fit, and install.

Nothing whatsoever is specified as to the grade, brand, or characteristic of the metal to be used. It is more than probable that if the grade of metal is ignored in the engineer's specification that the repair yard, too, will ignore it, and while they may endeavor to use a really high grade metal, its composition may be unsuited to the job in hand. While it is strangely true that a softer metal is not so liable to heat up as is a harder metal this advantage is greatly overwhelmed by the softer metal's tendency to flatten or squeeze out under working stresses, making continual adjustments necessary.

We know that in many small yards scrap metal is seldom junked, but is melted down and reused, and the composition therefore of many metalling jobs emanating from such yards is truly mongrel and only a supermetallurgist could begin to identify its constituents. It is liable to be several degrees too hard or too soft, or worse still to be alternately hard and soft over its finished surface.

Care must therefore be exercised

by the engineer in preparing work orders for metalling jobs. In foreign ports, where unfamiliar brands of metals are used, it is well for the interested engineer to observe the application of a hardness test on the metal to be used and to satisfy himself that he is getting just that metal and not a scrap alloy.

Combustion

Spontaneous and Otherwise

I HAVE recently discussed diesels with several old timers of the steam school who openly deplored conditions governing the granting of licenses to diesel aspirants, and who were not averse to predicting that the entire diesel fleet of the United States was destined to make a one-way trip to the bow wows.

"Why!" said one, "anybody with a steam ticket can apply for a diesel ticket after a few months' oiling on a diesel job. If they don't stiffen their requirements for diesel tickets, the boneyard will change from steam to oil."

Now, why all this excitement? True, the foreign candidate for diesel license must have spent from two to seven years in diesel shops before daring to appear before an examining board, but do you suppose for a moment that that makes the foreigner a better diesel man?

What can it be that causes many steam engineers to look upon a diesel plant as something profoundly intricate? A month or so in one of our great diesel building plants would promptly put them at ease.

I think that it would be a wonderful thing, and greatly beneficial to themselves, if some of our big diesel plants would make it their aim to gather in a few dozen marine engineers and work them in the erecting shops and testing floors for a while. The education thus given to the engineer would prove a mutual benefit unquestionably.

And last but not least, if you think for a moment that the local inspectors will hand you a diesel ticket for the asking, **just try and get it.** The examination for chief engineer of internal combustion plants will make you scratch your head more than once.

The Tight Corner

Cooperation Helps Us Out

IT was during the month of November, 1915, that the steamer of which I was chief engineer was returning to New York from a trip to Europe. She was a Lake built craft of the early model; engines and boilers well aft, the latter on a mezzanine deck; pilot house and steering wheel well forward, with the steam steering engine just abaft the engines. She was laden with rock, and not too much of it, just a load for ballast. Weather got rough leaving the English Channel, and she pitched badly, the engines racing wildly at times.

The steering engine was of a peculiar Lake type, with a sort of planetary gear arrangement between crank shaft and the chain drum. It was a noisy and rattling contraption at best, the gears being cast iron, and with considerable backlash due to long wear. One particularly rough evening about nine o'clock, one of these gears let go, and after a few grinding crashes the whole front of the machine came tumbling out. Of course the rudder was out of commission, and the vessel fell off into the trough of the sea, rolling heavily. The captain and his officers at once commenced to get the hand steering gear into action, but owing to the peculiar construction of the whole affair, the chains first had to be cleared from the steam steerer. Either that or loosen up on the turnbuckles at the quadrant, and these were most awkwardly placed. The engine room force began at once to clear away the wrecked machine and to get the chains out. The captain came below and asked if his men could be of assistance. As brawn and muscle were needed to get the mess pulled out, the offer was gladly accepted by the writer.

It may be well to say here that most pleasant relations had existed between the two departments, each always being willing to help to the best interests of all. While the mate and a couple of his men were getting the after hand steering gear in condition, the captain and three men were helping us below. All worked together, and in a few minutes we had the hand gear connected up, and under half speed got her around against the sea again. Her hand steering gear was right aft on the fantail, behind the deck house, and it was impossible for the deck officer to see the helmsman from the navigating bridge. So they put a man on the top of the after deck house to pass the word to the helmsman. As the crew were not too many in number, this made it hard for them. Besides this, in the event of the word-passer being unable to hear orders or see signs due to darkness, there was always an element of danger in case of an approaching vessel. However, things kept on until daylight, when the captain remarked to me at breakfast time that he wished he had a telephone to the after wheel from the bridge.

A happy thought struck me. This particular steamer had a fine air compressor and a good set of tools and, naturally, several lengths of heavy air hose. So I got help and dragged this hose up on deck, leading it from the bridge to the after hand steering wheel. The captain, seeing what I was about, rigged a wooden frame to hold the after end, and an oil funnel was attached to that part of the hose, acting as a sort of megaphone. The other end on the bridge was similarly fitted with a tin funnel from the steward's department, and we had a dandy means of communication between bridge and helmsman.

There was no possibility of making repairs to the steering gear at sea, so we got on fine with the rig as above described until New York was reached. Then I had good bronze cut gears put into the steering engine, with some minor improvements made, and the temporary "telephone" was put back into its locker. The incident goes to show that cooperation will work.

Long Pipe Lines with Oxwelded Joints is a booklet recently issued by **The Linde Air Products Company**, New York City, and contains a record of accomplishments in the oil and gas industries. The various jobs are illustrated and may be of interest in their possible application to marine work.

Cylinder Lubrication of Diesel Engines

By C. G. A. Rosen

THE lubrication of the cylinder walls of a diesel engine is of considerable importance. The mechanical operation of the high pressure, high temperature oil engine is intimately associated with the lubricating oil film existing between the traveling piston rings and the liner surface. Maintenance costs have a close relation to the maintenance of lubricating quality afforded the reciprocating piston. The ultimate value of a diesel installation may even be determined by the direct and secondary effects of cylinder lubrication. Lubrication costs, liner wear, piston ring wear, piston ring sticking, blow-by, carbon deposits, piston seizure, and compression losses are undoubtedly related to cylinder lubrication and can be influenced mightily by the engine room crew. A certain amount of experimentation is sometimes necessary to determine the best operating conditions, but care should be exercised when altering lubricating factors concerned with expensive parts which may be impaired or possibly destroyed by carelessness or lack of knowledge.

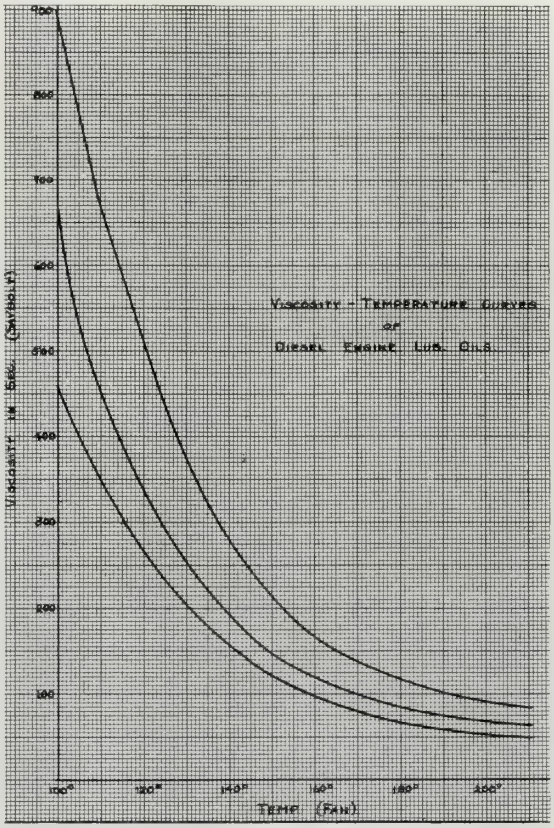


Fig I

Characteristics of Cylinder Lubricating Oil.

Cylinder lubricating oil should be suited to the particular engine to which it is applied. Any one grade of oil will not satisfy all cylinder conditions. All of the large oil companies produce excellent oils designed to be satisfactory as diesel engine lubricants. Sometimes, however, other grades of oil not designated as diesel engine oils may solve lubrication difficulties. Recently, a perplexing problem in high liner wear was satisfactorily overcome by the use of a compounded valve oil of western base.

Lubricating oil should be carefully refined to withstand the stresses of intensive service. It should be free from impurities such as acids, alkalies, resins, water, and solids. It should not readily emulsify with water. Perhaps the important characteristic requiring most careful attention and observation in service, is that of viscosity. This property determines the cohe- maintain a body in the oil film un- siveness or ability of the oil to der the temperature and pressure conditions existing within the cylinder. Some engines run hotter than others. Large engines have much hotter surfaces adjacent to the combustion chambers than small engines. Large engines, therefore, require heavier oils or oils of higher viscosity to maintain the necessary oil film. A cool-running engine would have difficulty in forming an oil film with oils of high viscosity. In Figure 1 the viscosity curves of three different grades of lubricating oil are shown.

Methods of Application and Distribution.

Various methods are employed in practice to introduce a cylinder lubricant to the interior of the cylinder and place it in the path of the distributing agency. The piston rings and piston provide the means for distributing or spreading the oil over the liner surface. In the majority of engines the lubricant is introduced in the lower or cooler portion of the cylinder, but in some cases it has been found expedient to apply the oil near the top of the liner. This latter method has sometimes given very satisfactory results.

The two types of systems employed in applying cylinder lubricants are: (1) Splash method, and (2) pressure lubricator method.

The splash method is sometimes used in trunk piston engines where close clearances can be maintained between the piston and liner. The surplus oil emerging from the main and crank pin bearings is thrown from the crank shaft and the resulting spray is deposited on the lower liner surfaces. The piston and rings subsequently carry this oil to the upper liner regions. Careful design and supervision are necessary in this system to prevent excessive oil from coming into contact with the hot gases of combustion. The excess oil will quickly decompose, forming carbon and resinous matter which collects around the piston rings within the grooves, rendering them inelastic by causing them to stick. This action finally results in blow-by and compression losses.

In the pressure lubricator method, ideal lubrication is attained when the system provides:

1. Uniformly measured amounts of sufficient lubricant;
2. Positive feeding at distribution points;
3. Correct timing of charge.

Lubricators may also be classified according to the state in which the lubricant is delivered to the cylinder walls as follows:

1. Solid jet under low pressure;
2. Air and oil spray under high pressure;
3. Solid jet under high pressure.

In large engines lubrication must be carried out more accurately than in small engines. The amount of heat liberated by the fuel valve during combustion increases as the square of the diameter. The liner surface, however, increases directly as the diameter. The heat passing through the cylinder walls, therefore, increases very rapidly as the cylinders become larger. It is important, therefore, in large diesel engines to carry out the requirements essential for ideal lubrication of the liner surfaces. The location and number of lubricating tubes must be determined so that the piston rings will be able to distribute the lubricant over the liner walls. Each lubricating tube or orifice should be provided with a measuring plunger at the high pressure lubricator. This high pressure lubricator should feel a solid column of lubricating oil and should be able to measure as small as one-tenth of a drop of oil per stroke at the orifice in the liner. It is essential to provide a valve or check directly behind the liner orifice in the lubricator tube as close to the final point of delivery as possible. The timing mechanism should be such that the entire discharge period will take place while the rings are passing the lubricator tube orifices. Recent tests seem to indicate that it is advisable to eliminate all air from the lubricator feed lines. The opportunity for oxidization of lubricating oil exists where air may be trapped in the presence of heat.

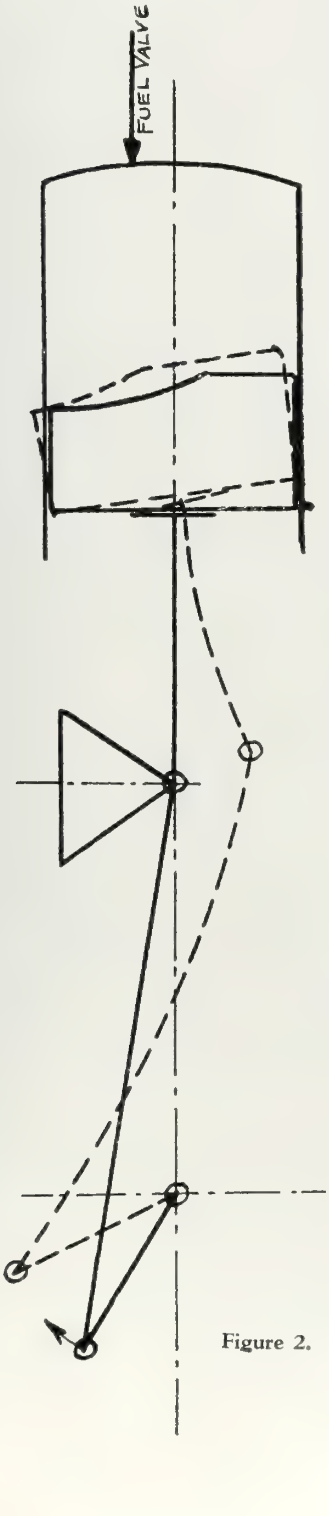


Figure 2.

Combustion Processes.

The lubricating system of the cylinder liner may be designed perfectly, but unless combustion of clean fuel is complete the oil film on the liner walls is bound to suffer. The diesel engine is a prime mover, the definite purpose of which is to burn fuel oil completely. This fact places emphasis on the need of clean fuel. This point may be best illustrated by using an actual example. In a large engine of 29-inch bore in which boiler fuel was burned, carbon was scraped off of the sides of a piston and analysed. The analysis revealed the following chemical characteristics of the scrapings:

Combustible and volatile matter	80.26%
Ash content	19.74%
Total	100.00%

(Combustible and volatile matter was burned slowly in a platinum crucible.)

Trouble was experienced by the engineers due to sticking piston rings and blow-by of gases into the engine room. High liner wear was also observed. About a year after the above analysis was made a centrifuge was installed for the purpose of purifying the fuel oil. A sample of the bowl cleanings, namely, all solid matter removed from the fuel, established the following chemical analysis:

Moisture and loss at 130deg. C. (Light oil)	21.5%
Heavy oil and carbon	59.5%
Total combustible and volatile matter	81.0%
Ash content	19.0%
Total	100.0%

The improved condition of the pistons and piston rings and the elimination of blow-by in the cylinders, which previously had been badly worn, verified the results of these chemical analyses.

Incomplete combustion will result in the formation of carbon and cause the deposit of carbon and ash in the oil film on the cylinder wall. The addition of this solid matter would naturally tend toward rupturing the oil film. After-burning is also a serious item when improper combustion takes place. If the fuel burns for a considerable distance down the stroke with high intensity, a considerable amount of cylinder surface is exposed to the decomposing action of the flame. The lubricating quality of the oil film will become greatly impaired as a result of improper or incomplete combustion.

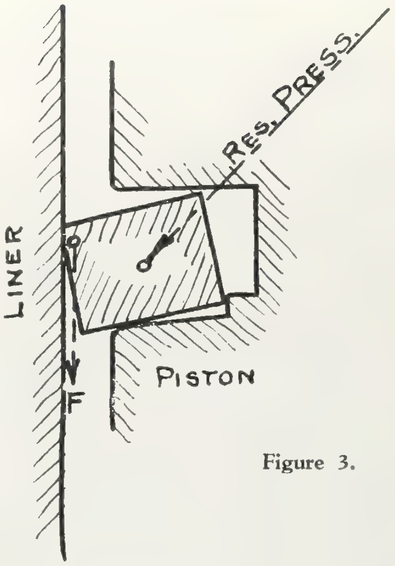


Figure 3.

Conclusion.

In concluding this article on cylinder lubrication, it may be well to make an analysis of an accident which occurred several years ago at sea. This event shows the influence of improper combustion and faulty lubrication on maintenance costs. The engine in question is illustrated diagrammatically in Figure 2. It is a 4-cycle, crosshead piston, marine diesel engine. The fuel valve was located to one side of the cylinder head. The piston was naturally dished on one side to accommodate the fuel spray and form a suitable combustion chamber. The lubricator was of the air and oil spray type. One feed from the lubricator was run to a manifold attached to the lower portion of the cylinder. The manifold fed four tubes placed equally on the periphery of the cylinder. The lubricant was, therefore, fed to the piston rings through four orifices. A single check valve was placed at the junction of the feed line and the manifold. The pressure lubricator was driven at crankshaft speed and arranged to deliver lubricating oil on the down stroke of the piston.

When going to sea with this engine, combustion was not perfect at all loads due to improper fuel valve design. Carbon, incombustible ash, and resinous residues passed off the top of the dished piston on to one side of the cylinder wall. Lubrication on this side was, therefore, seriously impaired. The carbon finally was dragged down to the lubricating oil orfices adjacent to the impaired oil film. In time one or two of the lubricator orifices were

(Continued on Page 41, Adv. Section)

Flettner Rudder

ONE of the most interesting developments in connection with improvements to navigation of vessels is the Flettner rudder, which represents a very radical departure from the conventional construction of ship rudder. Hundreds of these rudders have been installed on European vessels and have been operating over periods of several years with marked success.

In the Flettner rudder, the main blade of the rudder is perfectly free to swing about its turning axis and may swing through a complete circle. Left to itself, it immediately assumes a neutral position with respect to the current of the water through which it is passing. An auxiliary rudder, called the Flettner fin, is attached to the controlling edge of this main rudder. This fin, which is small in area compared with the main rudder, is hinged to it and is controlled by the steering mechanism so that it may be swung into any desired angle with respect to the main rudder. The steersman controls the fin only and the fin automatically controls the main rudder by the action of the current on the surface of the fin. The small area of the fin having a longer lever arm on the rudder post is able to control the large area of the main rudder.

The first installation of these rudders made on an American vessel was applied to the U. S. destroyer Converse last April and has been in continually successful operation ever since. On October 21 a party of shipping men from New York was taken on to the Converse for a demonstration of this equipment. The Converse proceeded to the neighborhood of Ambrose Lightship and her captain then put the ship through her maneuvers:

Rudder hard over, right and left, at 15, 20, and 25 knots respectively, slowing down to a speed of one knot and showing the maneuvering ability of the rudder at this low speed; backing up, going astern at 5 and 15 knots. These maneuvers not only showed that a ship equipped with a Flettner rudder is always under perfect control, but that the Flettner rudder is much more sensitive and quicker acting than the old style rudder. For instance, at full speed the rudder was put hard over in five seconds, and the turning circle of the ship has been reduced about 33 per cent.

Lt. Thomas F. O'Brien of the Bureau of Construction and Repair, Navy Department, Washington, explained the details of the installation on the Converse and F. O. Willhofft, vice-president of the Flettner Corporation of America, pointed out the advantages of the Flettner rudder as applied to mercantile vessels.

The Navy Department had given permission for this demonstration in order to give American shipping men the opportunity to observe the rudder in operation, since the Converse is the first American vessel which has been equipped with one of the Flettner rudders.

Among those present were Captain R. D. Gatewood, W. S. Owen, Geo. M. Walker of the United States Shipping Board; E. H. Rigg, naval architect, of the American Brown Boveri Electric Corporation; B. E. Meurk, superintendent engineer of the Isthmian Steamship Lines; E. C. Bennett, consulting naval architect; A. M. Tode, superintendent of the Technical Division, Marine Department, The Texas Company; Messrs. Kimball, Bennett, Downs, Le Pourneau, Kedward of the Standard Oil Company (N.J.); A. R. McMullen of the Federal Shipbuilding & Drydock Co.; Joseph W. Powell, formerly president of the Emergency Fleet Corporation; H. E. Rogers, president of the Flettner Corporation of America; and captains of the prominent steamship companies.

The advantages of the Flettner rudder are (first) that it lends itself to a perfect streamline shape, giving better propulsive efficiency to the entire ship; (second) that it is a free current actuated rudder requiring less power for its functioning and enabling it to act automatically so as to give the ship a minimum of yaw in a sea way.

Some objections have been raised to the Flettner rudder, theoretically, by naval architects and others, and these objections have largely been minimized or overcome by practical experience with the rudder itself. For instance, it has been said that "the ship would not be under control when traveling at low speed or when docking or leaving the pier." The Converse, with her Flettner rudder, has traveled about 7000 miles, negotiating in every kind of constricted water and has had no difficulty whatever in maneuvering and making just as perfect landings under various conditions of wind and tide as she formerly made with the same steering gear. On reversal, the Flettner rudder immediately "flops" 180 degrees. In Europe over 100 vessels plying on such waterways as the Rhine and Danube have been equipped with Flettner rudders and are operating perfectly.

Another objection is that it is "difficult for officers to get used to the new style rudder." The only sense in which this is so is that the rudder is more sensitive than the old style. So far as the operation of the wheel in the pilot house is concerned, there is absolutely no difference either with orders given or method of their application.

A third objection is "moving parts under water cannot be inspected and may get out of order." Moving parts under water with the Flettner rudder are the fin, itself, two yolks, and two connecting rods. The yokes and the rods are enclosed in the hollow rudder and are fully protected, and there is no reason why they should ever get in trouble. They may be inspected at the annual dry-docking. On dry-docking the Converse after three months of operation, no wear could be detected on the yokes or rods. Any ordinary wear in bushings will not interfere at all in the action of the rudder.

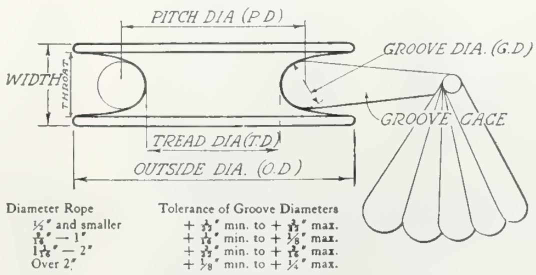
The Flettner rudder does require a special stern designed in new ships to secure its full advantage, which requires the swinging of the rudder through 360 regrees. However, a large part of the advantages connected with the Flettner rudder can be secured in any ordinary rudder through the application of the Flettner fin by connecting the yoke of the fin to a fixed point or by controlling this motion through stationary cams, the main rudder being operated positively as in the old style. This type of positively controlled Flettner rudder is protected by a separate patent and has been installed on a number of conversion jobs.

The Flettner rudder is controlled in America by the Flettner Corporation of America, with headquarters in New York.

Do the Sheaves Fit the Rope?

By Walter Voigtlander, Rope Engineer, American Cable Company.

Proper Groove Diameters for Various Size Ropes



Diameter Rope	Tolerance of Groove Diameters
½" and smaller	+ 1/32" min. to + 3/32" max.
9/16" — 1"	+ 1/16" min. to + ⅛" max.
1 1/16" — 2"	+ 3/32" min. to + 3/16" max.
Over 2"	+ ⅛" min. to + ¼" max.

Diagram showing how to fit wire rope to sheave Groove.

THERE is perhaps no single element that can be more detrimental to wire rope than an improperly fitted sheave. A pinching sheave, for instance, will do more damage to a wire rope in one hour than a properly grooved sheave could in an entire week or more. Or a sheave with too soft a tread will increase abrasion and grinding action to an extent that will cause premature breaking of the outer wires and loss of rope strength. Because of these facts and because sheaves are cheaper than good wire rope, it may be well to look to the sheave and auxiliary equipment if it is felt that the life and service being received from present rope is not all that it should be.

Engineers and operators sometimes overlook the fact that by the time it becomes necessary to install a new rope the old sheave will have become worn to such an extent that it will cause serious loss to the service of the new rope. Invariably excessive wear to the outer wires can be traced to the abrasive action of worn or too soft sheave treads.

When installing a new rope, therefore, it is economy to gauge both the rope and the grooves of all sheaves and drums. If the groove diameter of any sheave is less than the actual callipered rope diameter, decreased service is bound to result. One of the simplest and most accurate methods for gauging sheave treads is through the use of a groove gauge as indicated by the accompanying illustration. If this device is used with care, and if the tolerances given in the accompanying table (which have been worked out in accordance with long experience) are strictly adhered to, there may be reason to expect longer and more satisfactory rope service.

At the time such attention is given sheaves it is well, also, to check up on alignment. Alignment will cause considerable wear to both rope and sheaves. Particularly in high-speed work is it necessary to maintain proper alignment of all equipment and to balance all sheaves.

The Viking Engine

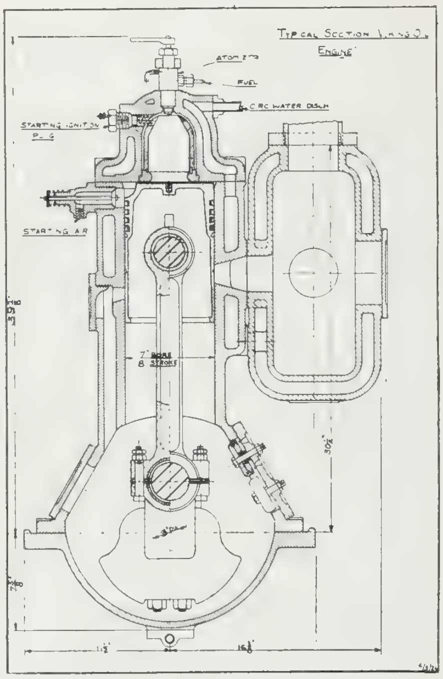
AMERICAN owners of small workboats have recently been showing a great deal of interest in the application of diesel power for propulsion. One of the most interesting developments in a small power diesel engine is the Viking engine, designed by F. H. Stroud of Seattle, who for many years has been carrying on extensive experiments looking to the production of a successful low pressure, small power, oil engine capable of standing up under the severe test of marine use.

The Viking engine has now been thoroughly tested over a period of five years and is being manufactured in 12-horsepower cylinder sizes in combinations of one, two, three, and four cylinders both for marine and stationary industrial purposes. The Viking oil engine is of the low compression, two stroke cycle type. It is very simple and substantial in design, with easy accessibility. It is constructed of the best materials throughout and is conservatively rated in proportion to piston displacement. Viking engines will develop from 20 to 25 per cent. over their rated horsepower.

The Viking engine works under a compression pressure of 130 pounds and a peak combustion pressure of 260 pounds per square inch under normal full load conditions. This low compression results in low bearing pressures, elimination of heavy casting strains, low heat factor, simple operation, safety, long life, economy in operation, and light weight.

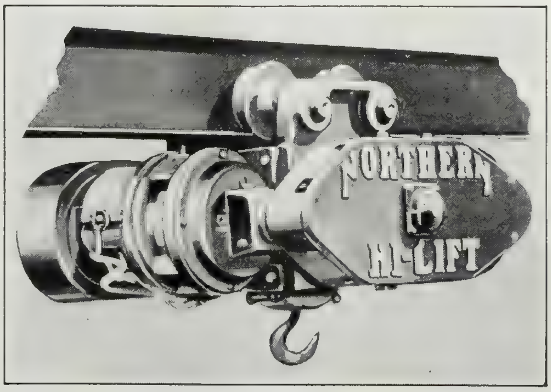
All parts of the Viking engine exposed to heat of combustion are entirely water-jacketed. An efficient air starting feature is incorporated in the design, together with an electric heating element for starting from cold. Air for starting is provided by an air compressing apparatus which comes with the engine. Owing to the special design and construction of cams and injection apparatus, the fuel is injected in the cylinder in the form of a very fine spray, even when the engine is idling at a very low speed. This feature of the design results in extreme flexibility under all load conditions and some of these engines on fishing boats have been operated continuously at ¼ to 1/3 normal speed without any ill effect.

It is stated that the fuel consumption of the Viking engine is 0.06 pound or less per brake horsepower hour and that the lubricating oil consumption will not exceed 0.028 pound per brake horsepower hour. A number of Viking oil engines have been operating successfully for considerable periods of time on various types of craft and service in Puget Sound waters.



The Markey Machinery Co., Seattle, manufacturers of the engine, have recently appointed E. V. Winter of San Francisco as distributor of their products for California.

New Series Northern Hi-Lift Hoist



THE Northern Engineering Works, with main office and factory at Detroit, have recently added to their line of cranes and hoists a new series of Hi-Lift Hoists which, in both design and construction, as well as operation, is a distinct stride forward in this field.

The new Hi-Lift is of compact design, rigid construction, and, besides ready accessibility and high efficiency in operating, it features an exceptionally high hook lift, the advantages of which are appreciated by all users of such equipment, especially those manufacturers and warehousemen having plants with low ceilings.

Many enthusiastic expressions have been received by the company from those who have inspected and tried this new equipment. Additional data may be had by writing direct to the Detroit office and mentioning this paper.

Foster Pumps

THE Foster Pump Works of Brooklyn is one of the oldest manufacturers of rotary pumps in the United States. The company was founded in 1860 and has followed intensively all of the immediate engineering developments in connection with the improvement of centrifugal pumps and rotary pumps and blowers.

Foster pumps have been, and are being, used in practically all of the large paint and varnish manufacturing plants, refineries, and on board oil tankers. Many of the rotary pumps manufactured by this firm have been in operation for over forty years with practically no repairs except new blades and springs, and are still operating 100 per cent.

The Foster Pump Works has recently developed a motor driven type of rotary pump in connection with the Foster double reduction gear, which has proved very successful in operation. The pump with this type of drive is manufactured in capacities from 15 to 400 gallons per minute and for pressures up to 100 pounds per square inch. The pump, the gear reduction unit, and an electric motor are all mounted on a substantial iron base plate and furnished regularly for floor mounting. On special orders these outfits can be furnished for mounting on ceiling or on side wall.

The reduction gear consists of two sets of spare gears enclosed in an oil-tight case and run constantly in oil, which serves also to lubricate the bearings of the gear and pinion shafts. The cover of the gear case is readily removable for inspection.

The Foster Pump Works has recently announced that C. V. Lane of San Francisco has been appointed sales representative for California.

Another Ellis Channel Steel Barge

THE New York and Hastings Steamboat Company, a subsidiary of the Anaconda Copper Company, has under construction by Midland Barge Company at Salisbury, Maryland, its second deck barge built under the Ellis Channel System of steel hull construction. The deadweight capacity is 900 tons. Channels of 12-inch section are being used as in the first Ellis steel barge built for this owner. Steel was fabricated at Midland, Pennsylvania. The dimensions are—length 115 feet; width 34 feet; depth 9 feet 11inches amidships.

The barge has a cambered wooden deck 4 inches thick with a 6-inch camber, caulked and payed with pitch. There are three lines of fore and aft trussed girders with diagonal bracing at every frame extending from gunwale to bottom of the barge, port and starboard. Six heavy cross braces extend completely across ship. A heavy steel side rubbing plate extends all fore and aft and is flanged over gunwale on large radius to prevent chafing of lines. Heavy steel corner castings and a heavy rubbing plate at mid depth, all fore and aft increase stiffness. Owner's design of babbitted cleats and chocks is used throughout. The hull is specially ventilated. A two-cabin house lined with wood is provided for living quarters.

This is the forty-first hull to be built under the Ellis Channel System of steel hull construction. The naval architect is W. R. Esmond.

In this connection it has been announced that the Pacific Telephone and Telegraph Company, San Francisco, has recently ordered from the Wallace Ship Yard at Seattle a cable barge to be constructed on the Ellis Channel System. The Wallace yard works under license from the Ellis Channel System, Incorporated. This first barge built to the Ellis System on the Pacific Coast will be equipped for lifting, repairing, or laying submarine telephone and telegraph cables.

Largest Motor Liner Sperry Equipped

IT has been announced by the Sperry Gyroscope Company that the largest motor liner yet built, the Saturnia, recently completed by the Cantiere Navale Triestino, Monfalcone, for the Cosulich Line, is navigated and steered by their gyro-compass and gyro-pilot.

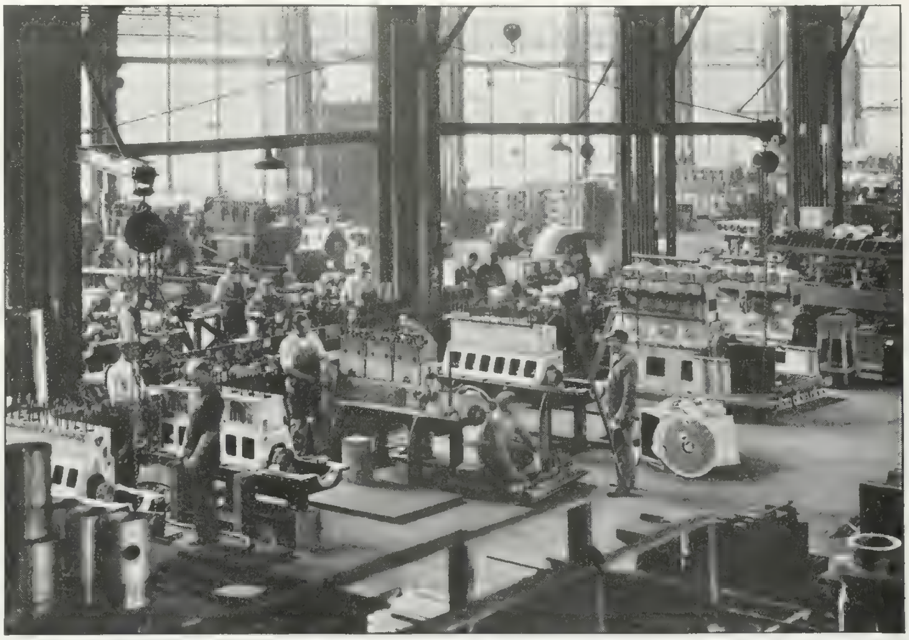
The Saturnia has a length of 631 feet 3 inches, breadth of 79 feet 6 inches, and depth of 16 feet 6 inches, a gross tonnage of about 23,500, and was engined by Stabilimento Tecnico Triestino. Her engines total about 20,000 shaft horsepower, giving a speed of about 19 knots. This leviathan of motor-driven craft accommodates 280 first class passengers, 257 second class, 309 intermediate first and second class, and 1350 third class passengers. The officers and crew number 441, giving a total complement of 2638.

Winton Business Reaches New High Peak

ONE of the busiest plants in the country right now is that of the Winton Engine Company at Cleveland.

For the past six months orders for Winton engines of all kinds, including auxiliaries, such as generator sets, pump sets, and air compressor sets, have been booked in unprecedented volume. The result is that the business now in process at this plant sets a new high peak for this particular company, and very likely for the entire marine engine industry.

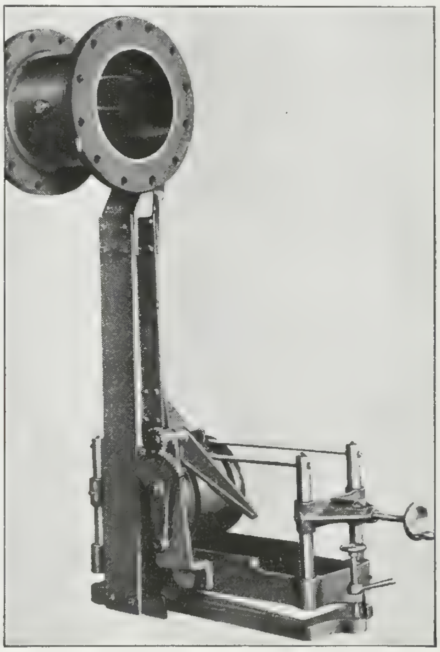
The Winton plant is an unusual place in many ways. One of the most striking features to be observed there, particularly at present, is the efficient way in which the production of engines of highest quality is increased to meet the demand, without the slightest sacrifice in the proper selection and use of materials and high class workmanship. And this is no slight task. But the Winton personnel is made up of masters in their respective lines, most of whom have been with the company for many years. They know their stuff from every angle. When you visit this plant, you find out quickly and emphatically why Winton engines have maintained their supremacy for so many years.



View in the erecting shop of the Winton Engine Company at Cleveland.

Present business under way totals more than \$2,000,000. As is well known, the line includes both gasoline and diesel engines, ranging from 50 to 1500 horsepower, for yachts, workboats, rail cars, moving picture lighting sets, and many other purposes. The illustrations show two views of the assembling department. Here are assembled all of the units built, from 7½ kilowatt generator sets to the huge 1500 horsepower diesels.

Looking down one bay of the erecting shop of the Winton Engine Company.



DENNIS PARTICIPATING GOVERNOR

Above is shown a picture of a model of the participating governor on exhibit at the Pacific Foreign Trade and Travel Exposition, San Francisco. This governor, actuated by a rolling weight on adjustable table, acts directly on the steam throttle of a marine engine whenever the ship pitches to a degree that will bring danger of racing the propeller. It thus saves the engine and the hull of the ship from much undue wear and tear. Complete description of the mechanism will be published in a future issue.

Important Clutch Announcement

THE American Manufacturing and Sales Co. of Raymond, Washington, for fourteen years manufacturer of reversible clutches, announces the appointment of Garvey & Palmer of Los Angeles, San Francisco, Portland, and Seattle, as exclusive distributors throughout the world for the American Reversible Clutch, the advent of which marks an important step forward in reversing clutches for all types of marine and stationary duty, in sizes of from 5 to 400 horsepower.

This clutch is a radical departure from any clutch construction heretofore attempted, and is the direct result of fourteen years of clutch manufacturing and actual experience gained with the design of various types of clutches and reverse gears by the largest clutch manufacturing concern in the West.

"The claims for this interesting clutch," Garvey & Palmer state, "are worthy of consideration, and are supported by numbers of enthusiastic users in the Northwest, where the clutch has found a ready market in almost every field of marine and stationary duty. The American company, having conclusively proved the soundness of its design and manufacture, is now prepared to invade the world's markets.

"It is claimed that it is the abuse instead of the use of reversing clutches that prematurely wears them out, and it was with this thought in mind that the American reversible clutch was designed and built. Its ability to stand punishment is proved by numbers of them in use on tugboats, fishboats, yachts, mills, mine gang cars, and various applications where extreme ruggedness is demanded and overloads are the rule and not the exception. The clutch will deliver 100 percent speed in reverse and from 94 to 97% actual horsepower for hours at a stretch without overheating, something heretofore deemed impossible.

Four-Wheel Brakes for Motor Vessels.

"From ahead to astern may be instantly changed with the engine running wide open, thereby stopping the vessel dead and starting astern within the boat's length.

"The American clutch is said to differ from all other clutches by using large rollers and spider gears for the reversing action, instead of the customary spur or bevel gears, the forward drive being handled by multiple disc plates. The two sets of rollers, together with spider gears, are made from alloy steel, heat treated. The ends of the rollers revolving in alloy steel bushings and the easy action of the spider gears rolling in and out of mesh, permit close adjustment, without excessive wear, almost noiseless action, and a minimum of vibration, the clutch housing being oil tight is another distinct advantage."

Garvey & Palmer report having made extensive investigations among the users, and personally trying out American clutches in both marine and stationary uses. They report that the clutch will not overheat after two hours of continuous reversing. There are eight rollers, or driving members, on each side, and the spider gears, or driven members, having only six teeth, give a ratio of 3 to 4, thus doing away with objectionable high speeds in the reversing mechanism. The clamping band for holding the drum in reverse is of spring steel, lined with brake lining. This band has special provision for take-up and preventing chattering. The general design permits easy accessibility and quick replacement of worn parts for long term use.

Garvey & Palmer have already launched their sales campaign and are planning to cover the United States markets as rapidly as possible, beginning first with the Pacific Coast. Stocks of all sizes of these clutches will be carried at their several Pacific Coast salesrooms. Negotiations are already commenced with several leading engine manufacturers who contemplate adopting American Clutches as standard equipment, and some interesting announcements will shortly be made. Garvey & Palmer anticipate a ready market among gasoline and diesel manufacturers in every field where a dependable, rugged, reversible clutch is needed, and while the present housing design, which is manufactured in 48 different horsepower ratings, follows customary American lines, the factory is prepared to promptly design and produce any type housing for special hook-up which offers a quantity market.

New Sales Aid Engineering Service for Los Angeles and Long Beach Harbors

GROWTH of shipping in Los Angeles and Long Beach harbors brings about the formation of a new marine engineering organization known as the Marine Engineering & Supply Company, Incorporated. Located at 117 East B street at Wilmington, the firm has one of the most up-to-date and conveniently situated engineering service plants to be found in any West Coast port.

With Paul W. Hiller as sales manager, Marine Engineering & Supply Company, represents the Western Cordage Company, Brunswick-Kroeschell, Walter Kidde & Company; Stewart Dickson Company ("Dixite" packing), France Metallic Packing; Kearfott Engineering Company; and the E. A. Key Company.

Through the experience of Mr. Hiller, who has had eight years in the refrigeration and engineering contract business, and who for two years, 1918 and 1919, was an engineer assistant to the superintending engineer of the Old Dominion Steamship Co., both marine engineers and owners in the Pacific Southwestern territory will have access to a "problem service" equal to any available anywhere. We congratulate Los Angeles and Long Beach harbors on the formation of the Marine Engineering & Supply Company. They will grow with their field!

A. L. Becker, well known marine consulting engineer of San Francisco, is advised through Captain Charles A. McAllister, that he has been unanimously elected a member of the American Bureau of Shipping. Captain McAllister, president of the bureau, notified Mr. Becker of his appointment following the recent meeting of the Board of Managers.

Link-Belt Belt Conveyor, Data Book 615. Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill. 148 pages, cloth bound.

This book contains numerous illustrations and tables designed to furnish details regarding belt conveyors and their application to particular conveying problems.

Marine Insurance

Edited by JAMES A. QUINBY

About Collisions

A Brief Survey, in Words of One Syllable, of Collision Liability and Its Relation to Marine Policies

IN its legally accepted sense, a maritime collision includes the contact of a ship with another ship or with any other artificial object. Impacts with sandbars, rocks, or shoals are not collisions, but come within the definition of the term "strandings." As commonly used, the word "collision" means the coming together of two vessels, and it is with this generally accepted sense of the word that we shall deal.

If a collision is due to inevitable accident or inscrutable fault, no one is liable for the damage. This defense, however, is often advanced but seldom proved. The same comments may be made as to a latent defect undiscoverable by due diligence.

Where Angels Fear to Tread

When you're wearin' golden shoes from inhaling poison booze
The bootleg graft will flourish just the same.
And them as walks the plank from a'buckin' faro-bank
Never keeps their sons and daughters from the game.

Now the child that's singed his paw, will regard a fire with awe,
And profit by the lesson he has learnt;
But there is no diminution of caloric execution
In the endless ranks of kids that ain't been burnt.

You may seek an application to the special situation
For a flock of rhyming couplets such as these—
Well, a lot of goofy brothers still ignore the woes of others
When they take a chance on cast-off policies.

If the first chap smoked his fingers, then his rueful mem'ry lingers
On a risk that paid two figures while its losses ran to four,
But the boys that were not in it (whose birthrate's one a minute)
Are as ready for the slaughter as Steve Brodie was of yore.

J. A. Q.

In common with other wrongful acts, liability for collision rests on some negligence, fault, misconduct, or tort for which one or both vessels may be responsible. Resort must be had to the nebulous and difficult rule of proximate cause to determine the element or act responsible for the contact. Once this is established, it is usually necessary to prove that a particular act is negligent. While the application of a hard and fast definition in this connection is difficult, it may be said that negligence is the failure to exercise that skill, care, judgment and nerve which a man of ordinary and appropriate prudence and skill for his position should exercise.

Opportunities for Negligence.

While a collision may be traced to faulty equipment or a deficiency of officers or crew, by far the most prevalent cause is negligent seamanship.

In most ordinary emergencies, the proper course of action is prescribed by rules of navigation, of which the American navigator deals with four; the International Rules for the high seas, and special rules for the Great Lakes, the Mississippi, and inland harbors and waterways. These rules set forth the lights and signals which must be carried by certain types of vessels, the courses a ship must hold in certain channels, and precautions she must take in harbors, anchorages, and congested places. A vessel meeting another proceeding in the opposite direction in approximately the same waters must port her helm and give two blasts of her whistle to indicate her intention to pass to starboard. A steam vessel must always give way to a sailing vessel. A vessel must yield to another vessel when the latter is approaching from starboard at right angles. An overtaking vessel must yield to a leading vessel. These and many other rules constitute the navigator's code of conduct, and a breach of any one of them may amount to negligence and charge the transgressor with liability for a resultant collision.

It should be noted here that an error in extremis—a last frantic effort to avoid collision—is usually not considered as negligent even if it involves the breaking of a rule of navigation. This doctrine is also found in land law. Another land law doctrine, that of the last clear chance rule, is sometimes invoked in admiralty cases. When both parties are negligent this rule charges liability to the one having the last clear chance to avoid the accident.

The doctrine of contributory negligence, a feature of common law preventing recovery if the insured party is in the slightest degree guilty of negligence contributing to the accident, has no place in the law of ocean collisions. Thus on land, if two automobiles collide and one of them is ninety per cent to blame and the other car totally demolished, the latter's owner cannot recover if it can be shown that he was ten per cent at fault.

The admiralty courts, however, will not inquire into the measure of negligence, nor will they dismiss the case entirely and thus work an injustice upon the man with the small degree of fault and the large degree of damage. If both vessels are to blame for a collision, the total damages will be assessed in equal proportions on the parties whose negligence concurred to create the loss. This is true no matter how great may be the disparity between the degrees of culpability displayed by the vessels.

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Both to Blame.

This doctrine, adopted in the United States in the case of the Catherine, 15 Law. Ed. 233, decrees to the vessel suffering most, one-half the excess of its burden over the losses of the other.

For example, if two vessels collide through the fault of both so that one vessel sinks, resulting in a total loss to her of $200,000, and the other vessel remains afloat and suffers damages of $100,000, the excess of loss to one vessel over the other's damages is $100,000, and the vessel remaining afloat will be liable to pay $50,000 to the other. Each will then have lost $150,000.

It should be noted that this 50-50 doctrine does not apply to passengers or owners of cargo aboard either of the vessels. These fortunate souls are able to recoup themselves for the full amount of their loss by a suit against either or both vessels. If they elect to sue the colliding ship, the latter may bring the carrying vessel into court under the provisions of Admiralty Rule 59. If Admiralty Rule 59 is not invoked, the cargo owner may recover in full from the colliding vessel, which may in turn deduct one-half such recovery from the hull damages, if any, which it may owe to the vessel carrying the cargo. This doctrine was established in 1899 by the United States Supreme Court in the case of the Chatahoochee, 173 U.S. 540.

Thus in the Luckenback-Lyman Stewart case, where the latter vessel was lost after a both-to-blame collision, independent owners of cargo on the Stewart recovered their damages in full.

Single Liability versus Cross Liabilities.

To revert to the rights of the two vessels in a both-to-blame collision, the courts of England and the United States have decided that there is not a double liability or duty on the part of each vessel to pay half the total damages, but rather a single burden on the vessel suffering the least to pay half the other's excess damage.

There are two forms of loss accruing to a ship in collision. One is damage to the vessel herself, known as "collision damage," and the other is liability which her owner incurs for damage done to the other vessel. The first of these two forms of loss is covered by the ordinary hull policy, either specifically or as one of the perils of the sea, and the underwriter pays the full amount of such damage to the assured.

The second form of loss is covered by the "collision clause," or, as it is sometimes called, the "Running Down Clause," or simply the "R. D. C.," in the hull policy. Properly speaking, it is liability insurance rather than hull insurance, and bears more resemblance to a P. and I. coverage than to vessel insurance.

In paying for collision damage to the vessel insured, the underwriter is not liable for demurrage or loss of time while the vessel is being repaired. But as between the vessel themselves, demurrage is a legitimate item of damage. Consequently when an underwriter has to pay under the Running Down Clause, he is decidedly interested in the demurrage of the ship which collided with the vessel insured. If such ship is not to blame then her demurrage, in full, is an item to be paid by the insured vessel, and, consequently, by the latter's insurers.

But if both vessels are to blame, this item of demurrage, under the doctrine of single liability, is a source of confusion. In arriving at the "single" liability running from the lesser damaged to the greater damaged vessel, the former is allowed to set off its theoretical payment of half demurrage.

For example, suppose—

A damages B, extent	$2000
B's demurrage	500
	$2500
A suffers damage, extent	$1000
A's demurrage	500
	$1500

Under the single liability theory, A pays B $500, or one-half the excess of B's damage and demurrage over A's damage and demurrage.

Underwriters' Position in Both-to-Blame Collisions.

Now let us examine A's position as regards his hull policy. He has suffered a particular average damage to his ship amounting to $1000, and ordinarily may collect that amount in full as a damage caused by perils of the seas.

He has become liable to pay and has paid $500 to B, but one-half his own demurrage has been credited in the balance to arrive at this $500. If he collected only the $500 under the four-fourths running down clause in his policy, the underwriter would be receiving credit for the $250 (half A's demurrage), which B is supposed to have paid to A under the single liability theory.

To avoid this inequitable result, the running down clause in hull policies normally includes the following provision:

". . . . when both vessels are to blame, then unless the liability of the owners or charterers of one or both of such vessels becomes limited by law, claims under this clause shall be settled on the principle of cross-liabilities as if the owners or charterers of each vessel had been compelled to pay to the owners or charterers of the other of such vessels such one-half or other proportion of the latter's damage as may have been prop-

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erly allowed in ascertaining the balance or sum payable by or to the assured or charterers in consequence of such collision."

With such a clause in his policy, our friend A would recover from his insurer as follows:

For Particular Average	$1000	
Less half received from B	500	
		$500
Under R. D. C.—half B's damage		$1250
		$1750

Under the same theory, B would recover from his insurer as follows:

For Particular Average	$2000	
Less half received from A	1000	
		$1000
Under R.D.C., half A's damages		750
Total		$1750

The collision clause thus insures an equitable recovery from an insurer of collision liability, no matter what method is adopted by the court in measuring liability between vessels.

Opinions Under Longshoremen's Compensation Act

DESPITE the acrimonious discussion that has taken place over the effect of the Longshoremen's and Harbor Workers' Act, the courts of the land have not as yet been called upon to interpret the measure. Our readers will recall that a commission was established at Washington to administer the act with deputy commissioners in fourteen districts of the continental and territorial United States, of which the thirteenth district, comprising California and the southwestern states, is handled by Deputy Commissioner Warren Pillsbury of San Francisco.

The act requires that employers of labor engaged in maritime pursuits shall carry insurance or post a suitable bond in order that their employees may participate in the benefits of the measure. In the absence of judicial interpretation, there has naturally been some uncertainty as to just what pursuits are maritime within the meaning of Congress, and numerous requests have been submitted to the Washington Commission by brokers and employers, which the Commission has answered by opinions, several of which are found in the opening pages of the October issue of American Maritime Cases. These opinions have not the force of judicial decisions, but are valuable as an indication of the future attitude of the commission.

It will be noted that many of the points decided are based upon cases distinguishing between the jurisdiction of admiralty law and state compensation acts, which arose before the federal measure was passed.

For a proper understanding of the compensations, it must be remembered that the federal act covers maritime workers, but specifically denies jurisdiction under the following conditions:

1. Where the person injured is an officer or member of the crew of any vessel;
2. Where a state compensation act may validly take jurisdiction of the injury.

With these points in mind, it is interesting to note that the commission has sustained its own jurisdiction under the following statements of fact:

1. As to a marine railway worker on the ground that such a worker is working in a "dry-dock" as provided by Section 2, Sub-section 4;
2. As to stevedores leaving a vessel until they are completely off the shore end of the gang plank. The commission is further of the opinion that a stevedore boarding a vessel is under the jurisdiction of the state compensation act until he has left the ship end of the gangplank and is actually aboard the vessel;
3. As to employees of ship chandleries, laundries, and similar establishments who come on board for the purpose of furnishing materials to the vessel. If the delivery is made to some individual such as an officer or a passenger, the Act does not have jurisdiction since the transaction is not maritime in nature;
4. As to port captains and other steamship officials who board the vessel to instruct its officers, on the ground that this is maritime procedure necessary to the conduct of commerce.

The commission has refused to accept jurisdiction in the following cases:

1. As to employees of a fishmeal factory engaged to operate the nets on fishing boats on the ground that such men are seamen and are expressly excluded by Section 2, Sub-section 2. The same position is taken as to crews of floating barges. The commission in these cases cites the Minna, 11 Fed. 759, allowing fishermen the right to proceed against the ship for wages;
2. As to employees working on floating rafts, constructing wharves, piers, or buildings on the ground that such men are not engaged in maritime employment;
3. As to men engaged in assembling and operating lumber rafts on the ground that (a) those assembling the rafts are not engaged in maritime employment; and (b) those operating the rafts are members of a crew;
4. As to employees of a shipbuilder on the ground

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that a ship does not become an engine of commerce until she is launched. This would not, of course, apply to repair of a vessel already in commission;

5. As to travelling stevedores who remain with the vessel and are paid by the hour for the time they work, on the ground that they are members of the crew;

6. As to employees engaged in breaking up or dismantling a vessel which is no longer in commission, on the ground that this is not a maritime operation.

Mixed Cargo

The Study Class of the Association of Marine Underwriters of San Francisco has taken up some widely diversified subjects this fall.

On the evening of October 17, Andrew J. Lynch, of the well-known brokerage firm of Cosgrove and Company, regaled the members with a more or less humorous discussion which was billed on the program under the heading of "Why Is a Broker?" Mr. Lynch pointed out several instances in his own experience where the employment of a brokerage firm would have saved money for the assured, and succeeded in convincing everybody present (save possibly certain underwriters) that the broker is an institution highly desirable.

In line with the policy of the Association, the members were afforded an opportunity to learn some interesting details regarding the production of a little-known product when F. Brewitt-Taylor, manager of the Bombay-Burma Trading Corporation at Bangkok, Siam, delivered a short but comprehensive survey of the teakwood industry in Burma and Siam. The class learned a great deal concerning the hazards to which the commodity is subject and betrayed a keen interest in Mr. Taylor's description of the use of elephants in the first stages of transportation out of the teak forests. Those present who were familiar with the redwood and Douglas fir industry were surprised to learn that it takes from three to five years to mark, cut and deliver a teakwood log to its shipping point.

The Study Class meeting of October 31 brought up rather an unusual subject. Mr. William Herron, vice-president of Boeing Air Transport, Inc., which handles the mail and passenger routes between San Francisco and Chicago, discussed the future of commercial aviation in its relation to insurance.

Since marine underwriters are now interested in many forms of coverage which are not strictly maritime in nature, such as truck transportation and other inland marine risks, it is not unlikely that transportation of goods by air will in the future be covered by marine policies. Mr. Herron described the provisions which are now being made to insure adequate lighting facilities for night flying over commercial routes, and pointed out the many advantages of air transport to mail, passengers, and express matter. Listeners were interested to learn that the ordinary mail plane with a full load of 1800 pounds, has about a 2000 foot margin in possible altitude when it passes over the Sierra. We wonder if the pilot would be allowed to declare a general average if he had to jettison a few mail bags in order to clear the summit.

The cargo of the late lamented Northland, which pessimistic underwriters estimated as high as $150,000, has turned out to have a loss value of less than $80,000.

Captain McCaulay, of Hibbs, McCaulay, and Smith, is all smoked up over the Fathometer, the new automatic sounding device recently approved by the Navy Department. The Captain says the Circinus and the Coos Bay could have been saved if equipped with such an instrument. If this is true—and we don't know whether it is or not—hull underwriters should order a gross or two of the things as Christmas presents for their clients.

We are in receipt of a communication from the Institute of London Underwriters giving particulars of a meeting in honor of E. F. Nicholls, ex-chairman of the institute, at which Mr. Nicholls was presented with a radio set as a token of the esteem in which he is held by his colleagues. We like to hear about such things. The London Institute and the San Francisco Board aren't so very far apart, nowadays. May Brother Nicholls' "8 Valve Receiving Set" never be troubled by static or run-down batteries.

And, now that we look to London as our preceptor in matters maritime (see New York court's decision in the Rennselaer case), our secretaries, presidents, and such may expect radio sets and smoking jackets at any time.

Jack Waddington and Harry Pinkham please note.

Psychology Lies Largely In Phrases

WHEREFORE, we submit for your approval a list of things we've had difficulty in reading without a smile:—

From the log: "Tempestuous and mountainous seas. Ship straining and rolling heavily."

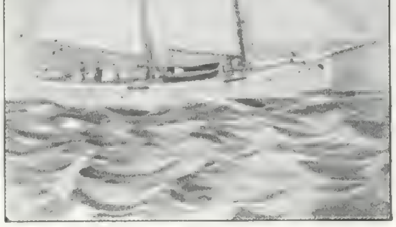
From the steamship claim agent: "This does not appear to be a claim for which the ship is liable because it is a claim you ought to recover from your insurance company."

From a summons: "The People of the State of California send Greeting."

From a marine policy: "The perils which the said Company is **content** to bear and does take upon itself are . . ."

From a libel for cargo damage: " . . . . damaged in an amount which libelant is as yet unable to determine, but which he believes, and on such belief alleges, will amount to the sum of . . ."

From Henrietta: "Yours truly."



Organization and Trade Notes

De Laval Pacific Company To Cover Entire Pacific Coast Direct

IN accordance with their plan to offer direct sales and service facilities to the ship operators of the Pacific Coast, George C. Stoddard, manager of the Industrial Department of the De Laval Pacific Co., 61 Beale Street, San Francisco, has just announced the appointment of Thomas V. Martin as sales engineer for the Northwest. Mr. Martin formerly was connected with the company at San Francisco. His Northwest headquarters will be 1306 L. C. Smith Building, Seattle. J. V. Shepard will handle the industrial centrifugal sales and service in the San Francisco district, and Sales Engineer E. C. Elvidge will continue to represent the company at Los Angeles, with headquarters at 312 Union Oil Building.

The De Laval Pacific Co. was formerly represented in the Northwest by agents, but under this new arrangement their present and future customers there, as well as on other parts of the coast, will have direct contact with the company.

The application of De Laval oil purifiers to fuel and lubricating oils is rapidly widening in the marine and industrial fields on the Pacific Coast. The centrifugal purification of fuel oil is becoming increasingly necessary to assure efficient and economical operation of marine oil engines. Keeping the oil in the circulatory lubricating systems of marine turbines and engines free from inpurities is also of vital importance. De Laval oil purifiers assure clean fuel and lubricating oils.

Thomas V. Martin.

The De Laval Pacific Co. is also Pacific Coast distributor for the Andale line of Simplex and Duplex strainers, grease extractors, oil coolers and heaters, and other Andale heat transfer equipment. Another well known product represented by this company is the Viking rotary pump for handling oil, water, and other liquids, ranging in capacities from 1½ to 1050 gallons per minute.

American-La France and Foamite Corporation

EFFECTIVE November 15, 1927, the American-LaFrance Fire Engine Company, Inc., of Elmira, New York, has acquired the assets and good will of the Foamite-Childs Corporation, of Utica, New York, and the business of the two companies will be combined under a single corporate identity. The name of the company will be the American-La France and Foamite Corporation.

For 82 years American-LaFrance Company has been recognized as the leader in the development and production of modern fire-fighting equipment. More than 90 per cent of the fire departments of this country are using American-LaFrance motor apparatus, extinguishers, and accessories. Also in industry, American-La France represents the standard in scientific, dependable fire apparatus. With long, successful experience in the manufacture of motor fire trucks, the American-LaFrance Company has also produced a complete line of heavy-duty commercial motor trucks which have gained recognition in every industry.

Foamite - Childs Corporation, whose organization dates back to 1897, has built up a fire protection service of wide application to industrial, municipal, marine, and private property. Manufacturing fire-extinguishing appliances of all types, Foamite-Childs Corporation developed the modern foam method of fire-extinguishing (Foamite Protection) to a remarkable degree of efficiency, safeguarding property against even such "extra-hazardous" fire risks as oil, gasoline, paint, and chemicals.

It is pointed out that the combining of these two successful organizations makes possible a broader and more complete service. It brings under centralized direction and operation a body of engineering experts, specially trained in industrial and fire department problems. Greater service facilities, greater manufacturing resources, a more complete and better balanced line of products, all will accrue to the benefit of the buying public.

The combination, American-La France and Foamite Corporation, will maintain sales offices and engineering representatives in all the principal cities of the United States and Canada. Affiliated companies will operate in foreign countries.

Duff Promoted

Stewart E. Duff, assistant to W. P. Bannister, assistant operating manager of the Pacific Steamship Company, San Francisco, has been appointed terminal manager for the Dollar Steamship Company at New York with headquarters at Pier 9. Jersey City, from which dock round-the-world liners and intercoastal steamers of the Dollar fleet sail.

Duff became affiliated with the Pacific Steamship Company in September, 1919, as assistant to Hugh Gallagher, then assistant operating manager of the company, but who is now operating manager for the Matson-Oceanic Line. Duff also saw service with the Admiral Line at Seattle.

In his new position Duff will succeed Captain W. D. L. Gilboy, who has resigned.

Chas. E. Lowe, for some time associated with the C. E. Rhodes Packing Company, San Francisco, has started in business for himself, at 162 Steuart street. Mr. Lowe, an engineer of wide experience, knows packing needs for all classes of engines and pumps. He will carry a line of the highest class of goods and also handle marine specialties and power plant supplies.

American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

SHIPBUILDING WORK IN PROSPECT

Hudson River Line Plans Motorships.

The Hudson River Night Line, New York, Mr. Crosby, general manager, is planning the construction of two diesel powered vessels for their passenger, automobile, and freight service between New York, Albany, and Troy. The vessels will be about 300 feet long and will have a speed of 16 knots.

Bids Opened for Construction of Lightships.

Bids were opened on October 15 at Washington, D. C., and at San Francisco by the Department of Commerce, Bureau of Lighthouses, for the construction of one, two, and three lightships, for propulsion machinery of the diesel-electric type and for pumps and other auxiliary equipment.

Low bid was submitted by the Albina Marine Iron Works, Portland, Oregon, being $188,616 for one ship and $182,000 for each additional ship.

Next lowest bid was submitted by the Elizabeth City Iron Works & Supply Co., Elizabeth City, N.C., being $200,000 for one boat; $392,000 for two boats.

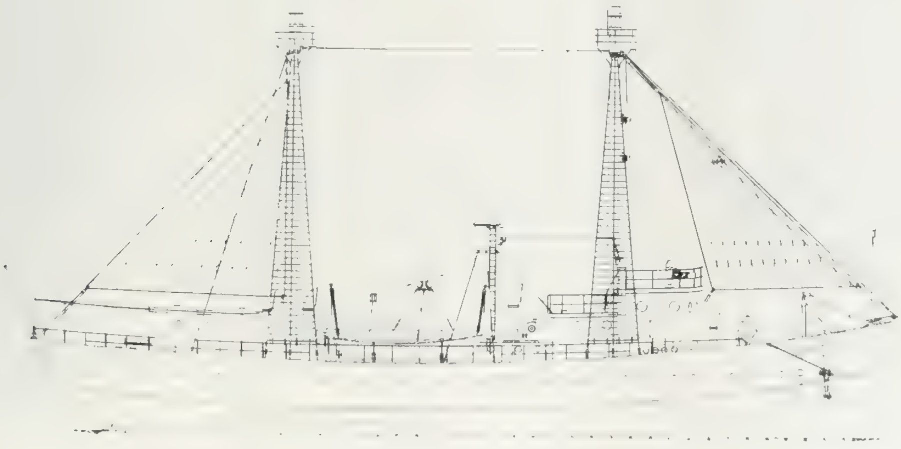
Low bid for the propulsion machinery was submitted by Bessemer Gas Engine Co., Grove City, Pa., being $54,376 for one ship, $51,753 each for two ships, and $49,756 each for three ships, price including Cummins auxiliary and General Electric generator.

Winton Engine Company, Cleveland, bid low on one propulsion plant—$52,950 including General Electric equipment; $103,950 for two ships, and $155,500 for three.

Union Gas Engine Company of Oakland, Calif., submitted a bid of $50,270 for one ship with General Electric equipment and $57,353 with Westinghouse equipment.

Separate bids were submitted by manufacturers of pumps, compressors, hoists, and windlass.

The Superintendent of Lighthouses at Washington is making a thorough investigation into the facilities and responsibilities of the Portland yard, together with other features of the various bids, upon which to base the award of contract and to determine whether one, two, or three ships will be built.



Outboard profile of proposed Lightship No. 100. The vessel will be 133 feet 3 inches over-all; 30 feet beam; 11 feet 9 inches draft; and will be powered with diesel-electric machinery.

Standard Oil to Build Tanker

The Standard Oil Co. (Calif.), John C. Rohlfs, manager of the Marine Dept., which last year purchased the tanker District of Columbia from the Shipping Board for conversion to diesel-electric drive, has arranged with the Board to continue to operate the vessel as a steamer by making an additional payment of the difference between $174,250, the price agreed upon and $492,000, the modified contract price.

The company has agreed to use the Busch-Sulzer diesel engines and the electrical machinery, ordered for the conversion, in a new tanker of not less than 12,000 tons deadweight, to be built in an American yard.

Specifications for Tugboat Out

Coolidge and Hanson, naval architects of Seattle, have about completed plans and specifications for a 125-foot tugboat for Young Brothers of Honolulu to be employed in towing pineapple barges. The order for the 350-horsepower diesel engine has been placed with Fairbanks, Morse & Company, San Francisco.

Bids will be opened December 6 at the offices of Young Bros., Honolulu, for the construction of this tug.

Proposal for Construction of Fast Transatlantic Liners

Lawrence W. Wilder, of New York, chairman of the Advisory Committee of the American Brown-Boveri Electric Corporation's Shipbuilding Division, and his associates will be given a hearing before the Shipping Board in December relative to the proposal for a four-day transatlantic liner service.

The hearing is to be preliminary to an application for a loan of 80 per cent of the cost of construction of ten 24,000-ton, 35-knot, turbine driven, passenger vessels planned for express passenger and mail service between New London, Connecticut, or Montauk Point, Long Island, and European ports, to be known as the Blue Ribbon Line. The estimated cost of the establishment of such a service will range from $190,000,000 to $200,000,000.

Steamship George Washington To Be Repaired.

The Merchant Fleet Corporation, New York, will call for bids soon for repairs and reconditioning work on the steamship George Washington of the United States Lines. The Board has authorized a total expenditure of $228,198 for the work.

Foss May Build Fireboat.

It is reported that Foss Co., Inc., of Seattle and Tacoma, has made a proposal to the Port of Tacoma, Washington, to build a combination tugboat and fireboat to be operated for the port on a rental basis. The proposed fireboat would be equipped with two 500-horsepower diesel engines and pumping capacity of 6000 gallons per minute, with two pumps, one delivering at 300 pounds pressure and one at 150 pounds pressure.

There is a report current that the Ford Motor Co. is planning the conversion of a steam freighter to diesel power. The vessel would be used in carrying rubber from Brazil to the Ford plant at Detroit.

New Atlantic Coastwise Vessel Planned.

The New England Steamship Company of Newport, Rhode Island, has called for bids for the construction of a passenger steamship, which will be similar to the steamship Nobska, built by the Bath Iron Works for this company in 1925.

The Nobska is 202 feet between perpendiculars, 36 beam, and 10 loaded draft; of 15 knots loaded speed, having a passenger capacity of 2000 and freight capacity of 100 tons. One 4-cycle triple expansion engine develops 1200 indicated horsepower; steam is supplied by two Babcock & Wilcox boilers of 4450 square feet heating surface.

Two Pittsburgh Firms To Build Tugs.

The Vesta Coal Company of Pittsburgh and the American Steel & Wire Company of the same city have asked for bids to be submitted for the construction of steel towboats to be used in towing their own barges.

New Ferry Company To Build Boats.

The New Jersey Ferry Company has been formed at Chester, Pennsylvania, by Edward T. Bartlett, president; W. D. Gash, vice-president; T. J. Sproul, treasurer; and Josiah Sleeper, secretary. The company will operate between Chester and Bridgeport, New Jersey. The immediate plans of the company call for the construction of two modern ferryboats to operate on an eight-minute schedule.

Bids In On Two Yachts.

Henry J. Gielow, Inc., 25 West 43rd Street, New York, has received bids from Atlantic Coast shipyards for two large yachts. One is to be 340 feet length and powered with 1500 horsepower diesel engines; the other is to be 240 feet length and powered with twin screw turbines. The prices on both yachts are considered too high, and further bids may be asked.

We understand that this architect is now planning a yacht for a Pacific Coast owner.

New Ferryboats in Prospect for New York.

The New York City Department of Plant and Structure is working on plans for the construction of a new ferryboat which will be similar to the 260-foot ferry American Legion recently built for this service. A. Goldman is commissioner in charge and R. W. Morrell is naval architect for the Department.

According to a report received from Redding, California, a giant gold dredger, one of the largest on the coast, is to be constructed near Five Pines, Trinity County, by interests represented by J. C. Cox, Chicago, Harold H. Braydon, San Francisco, and George Sayten, Los Angeles.

The Colombian Ministry of Public Works, Buenaventura, Colombia, will open bids December 8 for a tugboat of not more than 6 feet draft, for customs work at the port of Buenaventura.

SOME RECENT SHIPBUILDING CONTRACTS

Sun Shipbuilding Company, Chester, Pa., has an order from the Sun Oil Co. for a motortanker, the motive power for which has not yet been determined. The vessel will be 480 ft. long, 64 ft. 9in. beam, and 37 ft. depth.

Defoe Boat and Motor Works, Bay City, Mich., has an order from A. E. Fitkin of New York for a steel motor yacht, keel for which will be laid this month. The yacht will be 141 ft. 8 in. between perpendiculars, 23 ft. 2 in. beam, and 8 ft. draft. She will have diesel engines of 900 indicated horsepower, giving a speed of 15 miles an hour.

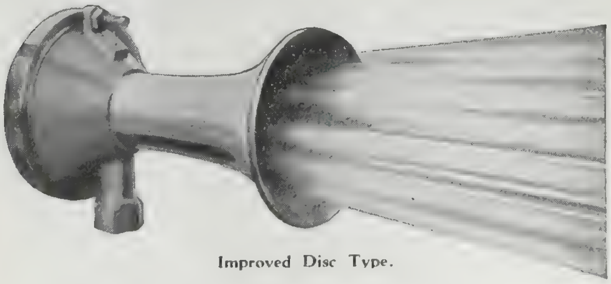
Howard Shipyards & Dock Company, Jeffersonville, Ind., has order from Captain Joel Vail, Mt. Vernon, Indiana, for a 40-foot towboat hull; an order from Fruin-Colnon Construction Co., St. Louis, for a 100-foot steel barge.

This yard also has a contract to build a 76-foot diesel tug for J. J. Hennen & Bro., Hawesville, Kentucky, to be powered with 200 I.H.P. diesel engines.

Prince Rupert Drydock & Shipyard, Prince Rupert, B. C., has an order for a 60 by 20 ft. pile drive scow for the Pacific Stevedoring Co.

James M. Campbell, Mobile, Ala., has an order from Captain Joseph Pose for a combination freight and passenger diesel-engined vessel of 1000 tons net register.

CUNNINGHAM
MARINE AUXILIARY EQUIPMENT



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The McCaffrey Co. .... San Diego

Electric Boat Company of New York (according to eastern press dispatches), a subsidiary of the New London Ship and Engine Company of Groton, Conn., has received a contract from the Japanese Government for the building of forty submarines. The total cost will be $80,000,000, with an additional $5,000,000 for periscopes. Henry R. Carse is president of the company.

Fellows and Stewart, Wilmington, Calif., have an order from the Los Angeles City Fire Department for a fireboat for Los Angeles Harbor. The boat will be 40 ft. long, 10 ft. beam, and will be powered with 290-horsepower Sterling Dolphin special engines sufficient to give her a speed of 20 knots and drive pumps while at fire. She will carry two centrifugal pumps of 25 gallons per minute capacity, three carbon dioxide fire extinguishers, and a Foamite fire extinguishing set of 500 gallons per minute capacity.

Dravo Contracting Company, Pittsburgh, has an order from the Ohio River Sand Company, Louisville, for a steam dredge 155 by 44 by 8 ft.; this company also has an order from The Arundel Corporation of Baltimore for ten 130-foot steel barges; an order for a floating A frame hoist for the U. S. Engineers, Louisville; and for two side dump scows for Monongahela and Ohio Dredging Co.

Five of the six gunboats ordered by the U.S. Navy Department from the Kiangnan Dock & Engineering Company, Shanghai, for the Yangtze River Patrol Force, have been launched and delivered. The sixth, the Oahu, will go into service on January 1.

The city council of New Westminster, British Columbia, has given John Stokkeland permission to build a shipyard on Lulu Island to cost $10,000.

Bureau of Yards and Docks, Navy Department, Washington, D.C., will open bids on December 14 for painting the fuel oil storage tanks at Pearl Harbor Naval Base. Specifications may be had from Washington, or the Commandant at Pearl Harbor or Mare Island.

REPORT OF SHIPYARD ACTIVITIES

The American Brown-Boveri Electric Corporation, Camden, New Jersey, announced on November 9 that E. I. Cornbrooks was appointed general manager of the Shipbuilding Division, to take the place of W. S. Newell, resigned. M. W. Torbet was appointed assistant general manager. It was also announced that the jurisdiction of Thomas R. Allen, Jr., general superintendent, was extended to cover all shops and operating departments of the Shipbuilding Division.

REPAIRS

General Engineering Receives Large Contract.

The steam freighter West Erral has been purchased by the Los Angeles Steamship Company for operation as an auxiliary freight steamer on its Los Angeles-Honolulu service. The vessel will be overhauled under the supervision of Pillsbury & Curtis, of San Francisco, to fit her for her new service. The **General Engineering & Drydock Company** of San Francisco, with drydock at Alameda, was awarded contract for this work on a low bid of $165,000.

The job calls for the installation of ample refrigeration space for the carriage of perishables; installation of two large cargo tanks to carry oil to the islands and bring back molasses; and the construction of extra fuel tanks.

Morse Drydock & Repair Company, Brooklyn, has received an important order for the rebuilding of the steamships City of Columbus and City of Atlanta for the Ocean Steamship Company.

Matson Liners to be Overhauled.

The steamer Maui of the Matson Navigation Company has been withdrawn from service and sent to the yards of the Bethlehem Shipbuilding Corporation, San Francisco, for complete overhauling and repairs. All passenger accommodations will be completely refurnished, installing beds in place of the customary berths, and every passenger stateroom will be equipped with running hot and cold water. The smoking room of the vessel is being enlarged to twice its former size and will in the future be used as a smoking lounge for the accommodation of both men and women travelers. The galley and pantry are being relocated adjacent to the dining room to facilitate meal service involving a complete rearrangement of the main deck, on which new staterooms and baths will be fitted. All settee berths are being removed and certain cabins are to be fitted with regular pullman berths to accommodate parties where three in a family or otherwise desire to travel together.

The Matsonia and Mano will also be withdrawn from service and similar improvements added.

KEEL LAYINGS.

Passenger and freight steamer for the Panama Pacific Line by the Newport News Shipbuilding & Drydock Company, Nov. 16.

Cement Barge for International Cement Corp. by American Brown-Boveri Electric Corp. in Oct.

Three carfloats for Pennsylvania Railroad by Federal Shipbuilding Co., Sept. 12, Oct. 5, and 24.

Three steel barges for U. S. Engineers by Howard Shipyards & Dock Co., Oct. 1, 17, and 25.

Two deck barges for Nashville Bridge Co., Oct. 15 and 25.

Steel yacht for Samuel A. Salvage, New York, by The Pusey & Jones Corp., Oct. 15.

LAUNCHINGS.

Two Fireboats Launched.

Two of the three fireboats building at the plant of Baker Construction Company, Portland, for the city of Portland were launched during November and named the David Campbell and the Mike Laudenklos. The three boats are 85 feet length, powered with Sterling gas engines and equipped with Byron-Jackson pumps.

Seattle Fireboat Launched.

The triple screw, all steel fireboat Alki for the City of Seattle was launched by her builders, the Pacific Coast Engineering Company, Oakland, California, on November 5. The boat, which will cost about $275,000, is 123.6 feet long, 26 feet beam, and 11.6 feet depth. She will have a maximum speed of 18 knots. Her power plant will consist of seven Winton gasoline engines, six of which will be connected through gears with the Byron-Jackson fire pumps, Allan Cunningham equipment to be used.

As this boat is a fine example of modern harbor fire-fighting craft, her completion and trials will be watched with considerable interest. A complete description of the boat appeared in Pacific Marine Review for May, 1927.

Sunoil, motor tanker for Sun Oil Co., was launched by Sun Shipbuilding Co., Oct. 22; carfloats for Pennsylvania Railroad Oct. 21 and 29.

DELIVERIES

Malolo, passenger and freight liner for Matson Navigation Co. by Wm. Cramp & Sons Ship & Engine Building Co., Oct. 27; Evangeline, passenger and freight steamer to Eastern Steamship Lines, Oct. 4.

Carfloat to D. L. & W. Railroad by Federal Shipbuilding Co., Oct. 22; carfloat to Pennsylvania Railroad, Oct. 25.

Steel barge for Pine Bluff Sand and Gravel Co., by Howard Shipyards & Dock Co., Oct. 15; towboat hull for Capt. Joe Vail, Mt. Vernon, Ind., Nov. 3.

Four deck barges for Nashville Bridge Co., Oct. 14; steel steamboat hull for Big Rock Stone Co. by Nashville Bridge Co., Sept. 6.

Shipbuilders Ask for Naval Work To Keep Yards Busy.

A delegation representing American privately owned shipyards appealed to Secretary of Navy Wilbur and Secretary of Commerce Hoover on November 10 to give more contracts for naval and other government building and repairing to private yards. The committee was made up of directors of the National Council of American Shipbuilders and was headed by Homer L. Ferguson of the Newport News Shipbuilding & Drydock Company. It was pointed out that the competition of the navy yards would have to be withdrawn if the private yards were to weather the present lull in shipbuilding in the United States.

Largest Submarine Launched at Portsmouth Navy Yard.

The V-4, largest submarine in the world, was launched at the Portsmouth Navy Yard on November 11. The submarine will not be completed until about June 1929. A sister —the V-5—is now under construction at the same yard, while keel for a third, the V-6, will be laid soon at the Mare Island Navy Yard.

Airplane Carrier Saratoga Commissioned.

The giant airplane carrier Saratoga was delivered to the Navy Department at the plant of her builders, the American Brown-Boveri Electric Corporation on November 16.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of December 1st:

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD,. UNION PLANT

Potrero Works, San Francisco

Purchasing Agent: O. W. Streett.

Steel dredge hull for U.S. Smelting, Refining & Mining Co., Oakland, Calif.; 128x60x12 ft.; 10 cu. ft. buckets; deliver Nov. 15/27 est.

Two steel dredge hulls, sisters to above; 148x60x12 ft.; 10 cu. ft. buckets; deliver one Nov. 15/27 est.

Steel dredge hull, sister to above; 168x60x12 ft.; 10 cu. ft. buckets.

Three steel dredge hulls, sisters to above. 100x50x11'4"; cu. ft. buckets; deliver one Apr. 1/28 est.

Barge No. 6, hull 5334, steel carfloat for Atchison, Topeka & Santa Fe Railway; 260 L.B.P.; 38 beam; 12'6" loaded draft; keel Sept. 27/27; launch Nov. 15/27 est.

Waialeale, hull 5335, twin screw passenger and freight vessel for Inter-Island Steam Navigation Co., Ltd., Honolulu; 295' L.B.P.; 48' beam; 17'4½" loaded draft; 15 knots loaded speed; 1800 D.W.T.; Westinghouse complete expansion geared turbines and electric motors; 400 S.H.P.; 4 Babcock & Wilcox water-tube boilers; 12,268 sq. ft. heating surface; keel Nov. 15/27 est.

GENERAL ENGINEERING & DRY-DOCK CO.,

Alameda, California

Purchasing Agent: Al. Wanner.

Not named, hull 12, diesel-electric wooden auto ferry for Golden Gate Ferry Co.; 240 L.O.A.; 44 beam; 10'6" loaded draft: 3 400 H.P. Ingersoll-Rand diesel engs.; Westinghouse 950 S.H.P. motors; keel Oct. 25/27 est.; deliver March 1/28 est.

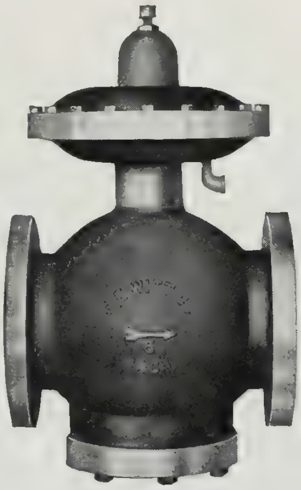
J. C. JOHNSON'S SHIPYARD

Port Blakely, Wn.

Reed No. 6, scow for Reed Mill Co., Shelton, Wn.; deliver Oct. 6/27 est.

Hull 122, scow for stock, 100 x 36 x

SIMPLEX
Marine Type
Frictionless No. 19
Pressure Reducing Valve



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9'6"; launched July 29/27.

Hull 123, scow for stock, 100x36x9'6'; launched Aug. 3/27.

Hull 124, self-dumping gravel scow for Pioneer Sand and Gravel Co., Seattle; 100x 36x11 ft.

PACIFIC COAST ENGINEERING CO., Oakland, Calif.

Alki, hull No. 4, fireboat for City of Seattle; 123 L.O.A.; 26 moulded beam, 7'6" draft; 14 knots speed; seven 6-cyl. 300-H.P. Winton diesel engs.; keel July 7/27; **launched Nov. 5/27.**

PRINCE RUPERT DRYDOCK & SHIPYARD, Prince Rupert, B.C.

One pile drive scow for Pacific Stevedoring Co.; 60x20 ft.

U. S. NAVY YARD, Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Two barges for Anderson & Tully, Memphis, Tenn.; 160x34x7'6".

Twelve barges for Tennessee Coal, Iron and Railway Co., Birmingham, Ala.; 140x 25x11ft.

AMERICAN BROWN-BOVERI ELECTRIC CORP., Camden, N. J.

Purchasing Agent: L. G. Buckwalter.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; deliver July 9/29 est.

Not named, light cruiser CL- 27 for United States Navy, 10,000 tons displacement; deliver June 13/30 est.

Hull 373, cement barge for International Cement Corp.; 163'x6"x37'4"x13'; keel **Oct. 1/27.**

THE AMERICAN SHIP BUILDING COMPANY, Cleveland, Ohio.

Purchasing Agent, C. H. Hirsching.

Harry Coulby, hull 798, bulk freighter for Pickands, Mather Co.; 607' L.B.P.; 65 beam; 33' loaded draft; 13 mi. speed; 13,-800 D.W.T.; T.E. engs.; 2800 I.H.P.; 3 B. & W. boilers; 200 lbs. pressure; keel Feb. 7/27; launched April 30/27; **delivered Sept. 10/27.**

Socony 111, hull 800, bulk oil barge for Standard Transportation Co.; 258 L.B.P.; 40 beam; 10 draft; keel March 28/27; **launched Aug. 20/27; delivered Sept. 3/27.**

Socony 112, hull 801, oil barge for Standard Transportation Co., sister to above; keel March 28/27; **launched Aug. 10/27; delivered Aug. 25/27.**

Robert W. Stewart, hull 802, tank steamer for Standard Oil Co. (Indiana); 373 L. B.P.; 52 beam; 20 loaded draft; 12 mi. loaded speed; 6200 D.W.T.; 1800 I.H.P. triple expansion engs., 2 Scotch boilers, 15'x4½" x11'6"x180 lbs. pressure; **keel Aug. 29/27.**

Not named, hull 803 motor tanker for F. C. Wright; 334 feet L.B.P.; 51 feet beam; 18 loaded draft; 11½ mi. loaded speed; 3700 D.W.T.; 1900 I.H.P. Werkspoor diesel engs.; aux. Scotch boiler.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT, Quincy, Mass.

Lexington, hull 1300, airplane carrier U. S. N., launched Oct. 3/25.

Hull 1408, oil tank barge for the Cities Service Refining Co.; 150 ft.; 7000 bbls. capacity.

No. 45, electric cutter for U. S. Coast Guard Service; 250x42x15 ft.; Westinghouse turbines and motors; 3000 S.H.P.

No. 46, sister to above.

No. 47, sister to above.

No. 48, sister to above.

No. 49, sister to above.

CONSOLIDATED SHIPBUILDING CORPORATION Morris Heights, N. Y.

Hull 2892, day cruiser for A. V. Davis, 34' length; 180 H.P. Speedway engs.

Hull 2895, day cruiser, 50 ft. for stock; 180 H.P. Speedway engs.

Hull 2896, cruiser for Paul H. Demming; 2-155 H.P. Speedway engs.

Hull 2897, cruiser for C. E. F. McCann, 95 ft.; 2-300 H.P. Speedway engs.

Hull 2898, cruiser for J. L. Parsons, 82 ft.; 2-300 H.P. Speedway engs.

Hull 2900, cruiser for R. L. Skofield, 64 ft.; 2-155 H.P. Speedway engs.

Hull 2901, tender for J. H. Seaman, 19'6"; 1-25 H.P. Speedway eng.

2903, cruiser for New York yachtsman, 64 ft.; 2-155 H.P. Speedway engs.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO., Philadelphia, Pa.

Purchasing Agent: John A. Budd.

Malolo, hull 509, express psgr. and frt. liner, Matson Navigation Co.; 582 L.O.A.; 577 length at water line; 83 ft. beam; depth molded to C deck 54 ft.; displacement 22,050 tons; 8250 DWT; speed 22 knots regular; 23 knots maximum; 25,000 shaft horsepower; Cramp-Parsons turbines; oil burning B. & W. water tube boilers; keel May 4/25; launched June 26/26; **delivered Oct. 27/27.**

Evangeline, hull 524, twin screw passenger and freight steamer for Eastern Steamship Lines; 378 length at water line; 55'6" beam; 29'6" molded depth to upper deck; 5890 tons displacement; 1040 D.W.T.; 18 knots; 7500 S.H.P.; two Parsons turbines with reduction gears; 6 single-ended Scotch boilers; keel May 1/26; launched February 12/27; **delivered Oct. 4/27.**

DEFOE BOAT & MOTOR WORKS, Bay City, Mich.

Purchasing Agent: W.E. Whitehouse.

Grathea II., hull 125, yacht for E. T. Strong, Flint, Mich.; 57'x13'x4'; 13 mi. loaded speed; 22 D.W.T.; 200 I.H.P. gas

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engs.; keel Aug. 1/27; launch and deliver Apr. 1/28 est.

Not named, hull 123, steel yacht, owner not named; 105 L.B.P.; 17 beam; 6 loaded draft; 13 loaded speed; 110 D.W.T.; 120 I.H.P. diesel eng.; keel July 11/27; launch Apr. 15/28 est.; deliver June 1/28 est.

Not named, hull 126, steel yacht for A. E. Fitkin, New York; 141′8″ L.B.P.; 23′2″ beam; 8′ draft; 15 mi. speed; 350 D.W.T.; 900 I.H.P. diesel engs.; keel Nov. 15/27 est.; launch May 15/28 est.; deliver July 1/28 est.

DRAVO CONTRACTING COMPANY,
Pittsburgh, Pa.

Hulls 588-590 inc., 3 standard steel barges for stock; 100x26x6 ft. 6in.; 135 gro. tons each .

Hulls 591-600 inc., 10 standard steel barges for stock, 100x26x6ft. 6in.; 135 gross tons each.

Hulls 615 and 616, two 120-H.P. stern wheel diesel towboats for stock; 74ft. 2in. x16ft. x 4ft.; 320 gro. tons each.

Hulls 632-634 inc., three complete maneuver hulls for U. S. Engineers, Pittsburgh, 93 gro. tons each.

Hulls 643 and 644 two covered steel barges for Inland Waterways Corp., Washington, D.C.; 126x33x7′6″; 485 gro. tons each.

Hulls 652-653, two steel deck scows for U.S. Engineer Office, Philadelphia; 102x30 x10 ft.; 400 gro. tons each.

Hull 656, 1 steam dredge for Ohio River Sand Co., Louisville, Ky.; 155x44x8 ft.; 480 gro.tons.

Hulls 659-668, 10 steel barges for Arundel Corp., Baltimore; 130x34x8′9″; 320 gro. tons each.

Hull 669, floating A frame hoist for U. S. Engineers, Louisville, Ky.; 205 gro. tons.

Hulls 670 and 671, two dump scows for Monongahela and Ohio Dredging Co.; 72x20x6 ft.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent, R. S. Page.

Dixie, hull 89, passenger and freight steamer for Southern Pacific Steamship Lines, Pier 49, North River, New York; 427 L.B.P.; 60 beam; 25′6″ loaded draft; 6700 D.W.T.; De Laval steam turbines; 7700 S.H.P.; 4 B. & W. boilers, 21,900 sq. ft. heating surface; 16,000 sq. ft. superheating surface; keel Jan. 31/27; launched July 29/27.

Hull 94, carfloat for D. L. & W. Railroad, 278 x 39 x 10ft.; keel July 21/27; **launched Oct. 19/27; delivered Oct. 22/27.**

Hull 95, same as above; keel Aug. 22/27.

Hull 96, carfloat for the Pennsylvania Railroad; 250x34x9 ft.; keel Aug. 8/27; **launched Oct. 14/27; delivered Oct. 25/27.**

Hull 97, carfloat, sister to above; **keel Sept. 12/27.**

Hull 98, carfloat, sister to above; **keel Oct. 5/27.**

Hull 99, carfloat, sister to above; **keel Oct. 24/27.**

Hull 100, oil barge for Hartol Products Co., New York; 175x36x12′6″; Isherwood bracketless framing.

GREAT LAKES ENGINEERING WORKS,
River Rouge, Mich.

Purchasing Agent: Chas. Short.

Hull 258, flat scow for Great Lakes Dredge & Dock Co., 165 x 42 x 12 ft.; keel Dec. 1/27 est; launch Jan. 31/28 est; deliver April 1/28 est.

Hull 259, flat scow, same as above; keel Dec. 1/27 est.; launch Jan. 31/28 est.; deliver April 1/28 est.

HOWARD SHIPYARDS & DOCK COMPANY,
Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hull 1627, steel barge for U. S. Engineers, St. Louis, Mo.; 100x25x5ft.; keel Sept. 30/27; **launched Oct. 25/27.**

Hull 1628, same as above; **keel Oct. 1/27.**

Hull 1629, same as above; **keel Oct. 17/27.**

Hull 1630, same as above; **keel Oct. 17/27.**

Hull 1631, same as above; **keel Nov. 1/27 est.**

Hull 1632, same as above; **keel Nov. 1/27 est.**

Hull 1633, steel barge for Pine Bluff Sand and Gravel Co., Pine Bluff, Ark.; 100x25x5 ft.; keel Sept. 15/27; **launched Oct. 14/27; delivered Oct. 15/27.**

Hull 1634, same as above; keel Sept. 15/27; **launched Oct. 14/27; delivered Oct. 15/27.**

Hull 1635, towboat hull,for Capt. Joel Vail, Mt. Vernon, Ind., 40 L.B.P.; 14 beam; 3 depth; **keel Oct. 11/27; launched Nov. 2/27; delivered Nov. 3/27.**

Hull 1636, steel barge for Fruin-Colnon Construction Co., St. Louis; 100 L.B.P.; 25 beam; 5 depth.

J. J. Hennen, hull 1367, diesel tug for J. J. Hennen & Bro., Hawesville, Ky.; 76 L.B.P.; 18 beam; 6 depth; 10 mi. speed; 220 I.H.P. diesel engs.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Purchasing Agent, H. Meyer.

Not named, hull 234, river car ferry for Pere Marquette Railway Co.; 400 L.O.A.; 53 beam; 22 depth; 4 P.M. boilers; two 3-cyl. comp. engs.; launch Sept. 15/27 est.; deliver Nov./27 est.

MARIETTA MANUFACTURING COMPANY
Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Stern-wheel towboat for Magdalena River, Colombia; 168x42x5 ft.; keel Aug. 4/27; launched Nov. 7/27 est.

Stern wheel tugboat for Magdalena River, Colombia; 173x44x5ft. 6in.; keel Sept. 1/27; launch Nov. 15/27 est.

Stern wheel towboat for Magdalena River, Colombia; 168x42x5ft.; keel Nov. 8/27 est.

Twenty steel hoppered cargo barges for Magdalena River, Colombia; 125x26x6 ft.

MIDLAND BARGE COMPANY
Midland, Pa.

One dredge hull for River Sand Co.: 131x30x5 ft.

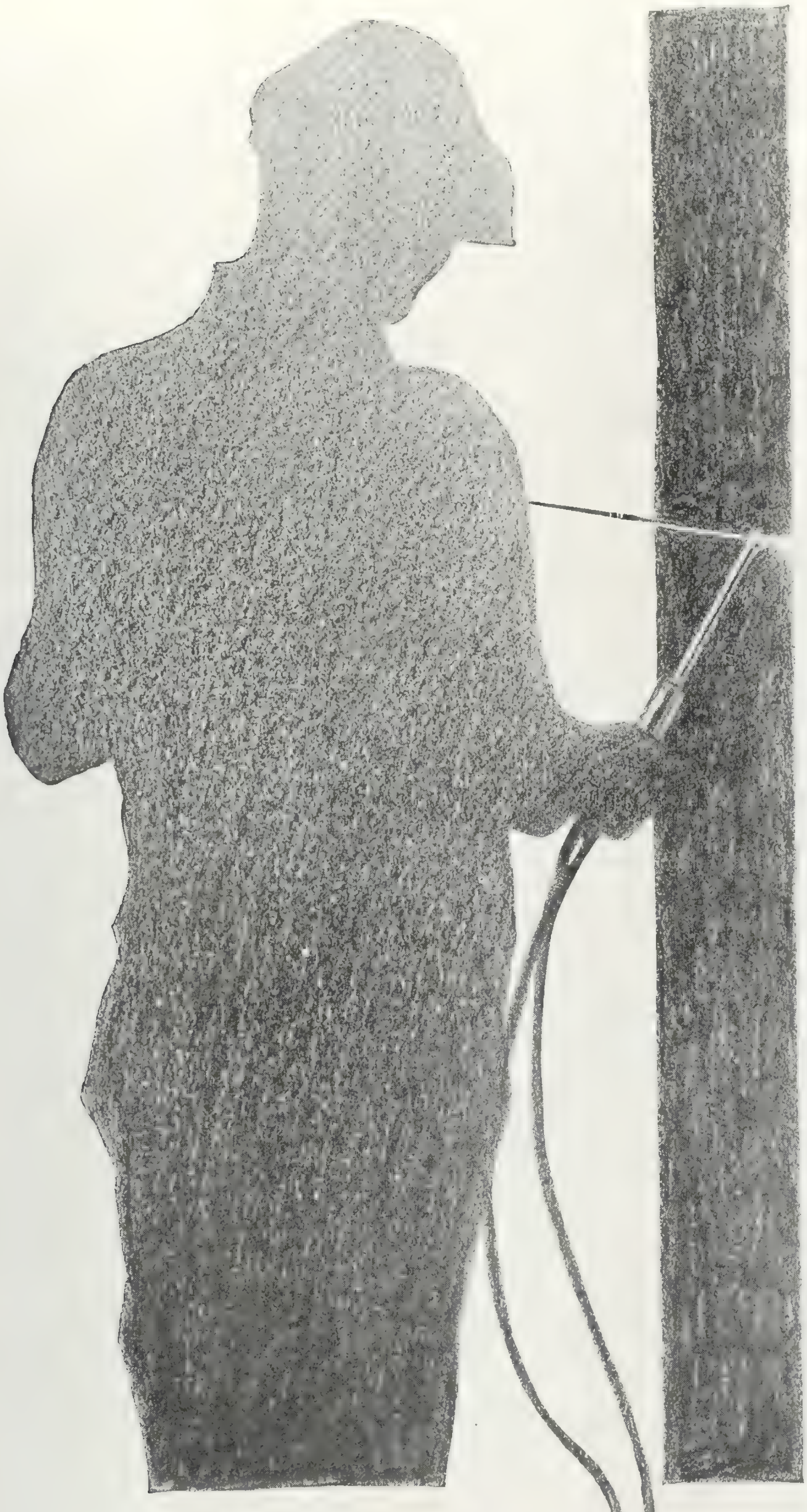
Four-sectional dry-dock for International Petroleum Co. of Montreal; 70x44ft.; four sections launched; deliver Dec. 1/27 est.

One steel flush deck barge for Dillman Egg Case Co.; 180x36x7 ft.

Fifteen cabin barges for Inland Waterways Corp., Washington, D. C.; 126x33x 7ft. 6in; **9 delivered; 5 addl. keels laid.**

Five barges for Inland Waterways Corp., 126′x33′/x7′6″.

Not named, towboat for E. T. Slider, New Albany, Ind.; 145x32x5ft. 6in.; keel March 1/28 est.



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One barge for Anaconda Copper Mining Co.; 115x34x10ft.; keel Nov. 15/27 est.

One steel derrick boat for International Petroleum Co., Montreal; 70x30x6 ft; keel Nov. 15/27 est.

NASHVILLE BRIDGE COMPANY,
Nashville, Tenn.

Purchasing Agent, Leo. E. Wege.

Hulls 124-127 inc., four deck barges for stock; 130x32x8ft.; keels July 25/27; Aug. 5/27; Aug. 15/27; launched Aug. 23/27; **delivered Oct. 14/27.**

Hull 128, steel steamboat hull for Big Rock Stone Co.; 96 L.B.P.; 24 beam; 4 loaded draft; keel Aug. 18'27; **launched and delivered Sept. 6/27.**

Hull 129, steel deck barge; 100x24x5ft.; keel Aug. 15/27; deliver Nov. 15/27 est.

Hull 130, same as above; keel Aug. 15/27; deliver Nov. 15/27 est.

Hull 132, deck barge, for stock; 100 L.B.P.; 24 beam; 5 loaded draft; keel Aug. 25/27; deliver Nov. 15/27 est.

Hull 133, deck barge for stock; 160x39x7 ft.; keel Nov. 15/27 est.; launch Dec. 15/27 est.

Hull 134, deck barge, for stock; 100x24x5 ft.; keel Oct. 15/27; **launch Dec. 1/27 est.**

Hull 135, deck barge for stock; 100x24x5ft.; **keel Oct. 25/27;** launch Dec. 10/27 est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

California, hull 315, 18-knot, passenger liner for Panama Pacific Line, New York; 600 ft. long, 80 ft. beam, 52 ft. depth; water tube boilers for oil burning, 22,000 gro. tons; 17,000 I.H.P.; keel Mar. 20/26; launched Oct. 1/27.

Not named, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; deliver June 13/30 est.

Not named, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement; deliver Mar. 13/31 est.

Not named, hull 325, bay steamer for Chesapeake Steamship Co.; 277' long, 53' beam, 18' depth; 2700 I.H.P.; 4-cyl. T. E. eng.; coal burning Scotch boilers; keel Sept. 28/27.

Not named, hull 326, 18-knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Nov./27 est.

THE PUSEY & JONES CORP.,
Wilmington, Del.

Purchasing Agent: James Bradford.

Savarona, hull 1034, steel twin-screw diesel yacht for Richard Cadwalader, Jr., Philadelphia; Henry J. Gielow, Inc., naval architect, New York; 294' L.O.A.; 38'3" beam; 16' loaded draft; 2 Bessemer diesel engs.; total of 3000 H.P.; keel Apr. 1/27; launched Sept. 12/27; deliver Jan. 1/28 est.

Not named, hull 1035, night passenger and freight vessel for Baltimore Steam Packet Co., Baltimore, Md.; 320 L.B.P.; 56'6" beam; 15'6" loaded draft aft; 18½ mi. speed; 1784 gross tons; 2600 I.H.P., 4-cyl. triple expansion engs.; 4 Scotch boilers, 13'8" diameter; keel Sept. 20/27.

Not named, hull 1036, steel twin screw diesel yacht for Samuel A. Salvage, New York; 150 L.O.A.; 139'9" L.W.L.; 22 beam; 7'6" loaded draft; 18 miles speed; 246 D.W.T.; 2 Winton diesel engines; 600 H.P. each; **keel Oct. 15/27;** launch Jan. 15/28 est.; deliver May 1/28 est.

SUN SHIPBUILDING COMPANY
Chester, Penn.

Purchasing Agent: H. W. Scott.

Sunoil, hull 106. motor tanker for Sun Oil Co.; 480' x 65'9" x 37'; 13,000 D.W.T.; 2800 S.H.P. at 80 R. P. M.; 4 cyl., 2-cycle Sun Doxford engs.; keel May 2/27; **launched Oct. 22/27;** deliver Dec. 15/27 est.

Not named, hull 107, tanker for California Petroleum Co.; 510'x70'x40'; 17,000 D.W.T.; 4500 S.H.P. at 82 R.P.M., 8-cyl., 2-cycle Sun-Doxford eng.; keel July 5/27; launch Dec. 17/27; deliver Feb. 10/27 est.

Hull 108, carfloat for Pennsylvania Railroad; 330'x38'x10'6"; keel June 30/27; **launched Oct. 21/27.**

Hull 109, same as above; keel June 30/27; **launched Oct. 29/27;** deliver Nov. 29/27 est.

Not named, hull 110, motor tanker for Sun Oil Co.; 480 L.B.P.; 65' 9" beam; 37' draft; motive power not yet determined.

TODD DRYDOCK, ENGINEERING, & REPAIR CORP.
Brooklyn, N. Y.

Purchasing Agent: H. J. Shannon.

Greenwich Village, hull 40, diesel-electric ferryboat for Dept. of Plant & Structures, City of New York; 101 ft. 6 in. length over guards; 27 ft. 7 in. beam; 6 ft. 8¾ in. loaded draft; 300 I.H.P. Nelseco diesel engine; keel Apr. 14/27; launched July 19/27.

Mott Haven, hull 41, diesel-electric ferryboat, sister to above; keel Apr. 14/27; launched July 19/27.

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

F. H. Hilliard, hull 62, diesel powered stern wheel survey boat for Mississippi River Comm., Dredging Dist., Memphis, Tenn.; 139'6"x24'x5'3"; keel June 2/27; launched Sept. 19/27; deliver Nov. 7/27 est.

Tecumseh, hull 63, steel hull diesel-electric stern wheel towboat for U.S. Engineers, St. Louis; 110x23x5 ft.; Lombard, 300 B.H.P., 400 R.P.M. eng.; General Electric motors and equipment; launch Dec. 31/27 est.; keel Sept. 22/27.

General Humphreys, hull 64, steel hull inspection boat for U. S. Engineers, New Orleans; 85x18x7ft.; diesel eng.; single screw; keel Nov. 21/27 est.

Repairs

BETHLEHEM SHIPBUILDING CORP., LTD.
Union Plant

Drydock, paint, misc. repairs: m.b. Rioco, Richlube, stmrs. Montebello, Multnomah, Katherine Donovon, m.s. Falsterbo, Sabotawan, Alvarado, m.b. General Borgstad, stmrs. Sierra, Circinus, U.S.S. New Mexico, Napa Valley, U.S.S, Tennessee, Angel Island, Calistoga (engine and boiler repairs), Corsicana, Lubrico, Shell Barge No, 5, tug Gerald C, sch, Frank D. Stout, Cricket, Commerce. Propeller repairs: stmrs. Edward F. Luckenbach, Maui, Charcas, Maunalei. Repairs to fire damage: President Hayes. Winch repairs: Albert Hill. Boiler repairs: tug F. A. Douty. Repairs to turbines and condensers: H. F. Alexander. Tail shaft repairs. Camden. Miscl. repairs: stmr. Castana, Munaires, m.s. Bronnoy, Forresbank, Union Barge 1923, stmr. Point Sur, Maui, Manchuria, Katherine Donovan, Heffron, Point Montara, m.s. Australien, Pacific Reliance, stmr. Waitemata, Wm. F. Herrin, Mongolia, Makura, Sutermco, Nora, Tejon China Arrow, Cathwood, Concordia, Akera, Lebec, Chilbar, Los Alamos, Camden, H. M. Storey, Franklin K. Lane, Nebesna, Crenatula, Nordanger, Larry Doheny, Keekoskee, Hagood, Richfield, Madras City, Aurora, San Lamberto, Tamaha, Anatina, Pennmar, Cowrie, Astoria, La Crescenta, S. M. Spalding, Radix, Emidio, Altair, Frank D. Stout, Mauna Ala, Briarwood, Claremont.

COLLINGWOOD SHIPYARDS, LTD.,
Collingwood, Ontario

Bottom damage repairs; tail shaft drawn for examination and stern bearing relined: s.s. J. Frater Taylor.

GENERAL ENGINEERING AND DRY DOCK COMPANY,
Alameda, Calif.

Repairs donkey boiler, misc.: stmr. Wilmington. Drydock, clean, paint, misc. repairs: stmrs. Fort Armstrong, El Capitan, Suisun City, tug Despatch (also new tail shaft; straighten wheel), stmr. Stanwood, Harbor Co.'s Barge, m.s. Standard Service, stmr. Phyllis (general overhaul), tug Sea Ranger, stmr. Annie Christenson, schr. Bretagne (also change location of generator from 'tween decks to main deck; built house over same; general repairs), schr. Faith (remodeled vessel), stmr. General Frisbie, Wallingford (deck, engine, and misc. repairs), Helen P. Drew (deck and engine repairs; recaulking). Drydock: ferry Golden Shore. Voyage repairs: stmr. Stockton. Minor repairs: Katherine G. Sudden, Renewed plates: stmr. Eleanor Christenson. Retubing boilers. C. D. Johnson III. General repairs: Bearport.

PRINCE RUPERT DRYDOCK & SHIPYARD
Prince Rupert, B.C.

Dock, clean, paint, annual overhaul: C. G.S. Newington. Dock, clean, paint and hull repairs: car barge G.T.P. No. 1. Docked, cleaned, painted, misc. hull and machinery repairs to 16 fishing boats. Misc. hull and machinery repairs: 36 fishing boats: 71 other commercial jobs.

TODD DRY DOCKS, INC.,
Seattle, Wash.

General reconditioning and alterations: Comfort. Dock, clean, paint, misc. repairs: City of Bremerton. Hull damage repairs: Pomona. Misc. repairs. Associated Lighter No. 7, ferry Crosline, stmrs. Chippewa, Parana, Olumpic m.s. Nyhaug.

U. S NAVY YARD,
Bremerton, Wn.

Dock, misc. repairs: Idaho, Omaha, Kanawha, Cuyama, Henshaw, Melvin, Percival, Zeilin, Wood, Decatur. Misc. repairs incidental to operation as district craft: Mahopac, Tatnuck, Swallow, Challenge, Pawtucket, Sotoyomo.

VICTORIA MACHINERY DEPOT CO.,
Victoria, B.C.

Dock, clean, paint, make and install new tail shaft, rudder repairs, stern bearing and thrust shaft: tug Edna Grace. Propeller repairs: Princess Royal, stmr. Otter. Dock, clean paint: stmr. Famous (also cut out and renew plates damaged in collision; boiler, engine, and deck repairs), tug Restless (also boiler and engine repairs) Deck repairs: stmr. Tacoma.

Our Billion Dollar Export Trade With Latin America

By O. K. Davis

THE rumor that we are slipping in Latin America has done harm both here and down there, but it's a complete dud. We are now selling Latin America almost a billion dollars' worth of goods annually, compared with our average annual sales of $300,000,000 before the war. We have raised our share of South America's imports from 14 per cent in 1910-1913 to 28 per cent in 1925. And according to current figures we will supply 30 per cent of all South America's foreign purchases this year.

	1911-13	1924	1925
United Kingdom	28.3	22.5	21.3
France	8.7	6.1	5.9
Germany	18.2	12.0	11.7
United States	14.4	25.8	27.8
Others	28.6	33.6	33.3
	100	100	100
United States	14.4	25.8	27.8
France, Germany and United Kingdom combined	55.2	40.6	38.9

An interesting table compiled by the National Foreign Trade Council showing the remarkable growth made by the United States in percentage of total trade with Latin America and the decrease in the trade of Latin America with United Kingdom, France and Germany.

For the whole of Latin America, including Central America and the West Indies, we have increased our share in the imports of these twenty republics between 1913 and 1925 from one of about 25 per cent to one of 37½ per cent. And for Central America alone our share as a supplier has grown from one of 40 per cent to over 66 per cent during the same period.

On the other hand, our chief competitors—England, Germany and France—have seen their proportion of Latin America's imports as a whole decrease from more than one of 50 per cent in 1913 to one of 33 per cent in 1925. As a matter of fact, we are supplying Latin America with substantially more goods than our three competitors put together, the figures being $914,000,000 as against $804,000,000 for the latest comparative tables, those of 1925, while in Central America alone they supplied in 1925 but 16 per cent of the imports against our 66 per cent. Our competitors in Latin America are keen and alert, but it is notable that it is they who are copying our methods today. We may not be making the most of our opportunities, but it is they who are slipping, not we.

We find, on looking more closely at the actual figures, that in every country in South America, with the exception of Paraguay, we are the principal supplier of goods. In 1913 this was true only in the cases of Colombia, Venezuela, Ecuador, and Peru. Now it is true with respect to Argentina, Brazil, Chile, Uruguay, and Bolivia as well, and there is only 1 per cent difference between ourselves and England even in the case of Paraguay.

This represents an extraordinary growth considering the fact that in 1890 our exports to South America were only one-tenth of the total she received, and had only grown to one-sixth before the war. Now they are almost one-third and there is no sign anywhere that this steady growth is being or is going to be arrested.

One reason for this increase of United States trade that is not far to seek is the great development of our investments. From about 100 millions before the war they have grown to over a billion and a half dollars in South America in the present year, According to the latest figures of the Bureau of Foreign and Domestic Commerce, our trade in Latin America rests on a solid triangle of investments wherein a billion and a half dollars is invested in Cuba, another billion and a half in Mexico and Central America, and more than a third billion and a half in South America, making a total of between four and a half and five billion dollars of American money which we have now invested to our account throughout Latin America. Since 1919 flotations of government and business loans in Latin America in this country have amounted to about $200,000,000 a year and have approximated the very substantial sum of $2,000,000,000 of new post war investment.

This is a very solid reason why our trade grows and continues to grow. Another contributing cause

Country	Per cent of Total Imports From United Kingdom			Per cent of Total Imports From United States		
	1913	1924	1925	1913	1924	1925
Brazil	24.5%	23.9%	22.5%	15.7%	24.2%	24.8%
Argentina	31.0	23.6	21.6	14.5	23.1	23.4
Chile	29.9	20.9	20.7	16.7	23.5	27.5
Uruguay	24.5	18.3	17.7	12.7	26.3	26.2
Colombia	20.5	21.5	21.6	26.7	50.0	54.0
Venezuela	23.8	18.7	20.1	38.5	55.4	53.4
Peru	26.2	18.6	18.5	38.8	40.0	39.0
Ecuador	29.0	23.3	23.1	31.0	40.3	44.0
Bolivia	20.2	21.3	20.1	7.4	28.5	27.0
Paraguay	28.6	18.9	16.0	6.0	13.7	15.0
Cuba	11.5	4.0	4.0	53.7	66.0	63.0
Mexico	13.9	7.5	8.0	50.6	72.0	70.0

Table showing the percentages of trade enjoyed by the United Kingdom and by the United States with various Latin American countries.

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†M.S. City of S.F.	Dec. 28	Dec. 30	*S.S. Colombia	Dec. 31	Jan. 10
*S.S. Ecuador	Jan. 7	Jan. 9	†M.S. City of Panama	....	Jan. 11
†S.S. Corinto	Jan. 21	....	*S.S. Venezuela	Jan. 21	Jan. 31

†Ports of call—Mazatlan, Champerico, San Jose de Guatemala, Acajutla, La Libertad, La Union, Amapala, Corinto, San Juan del Sur, Puntarenas, Balboa and Cristobal.
*Ports of call—Mazatlan, Manzanillo, Champerico, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal and (Havana eastbound only), Cartagena and Puerto Colombia (Westbound only), and New York.

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Countries	Total		U. K.		France		Germany		U. S.	
	1924	1925	1924	1925	1924	1925	1924	1925	1924	1925
10 No. Amer. Republics	563	626	34	40	21	26	28	33	386	412
Percentage	100	100	6	6½	3¾	4¼	5	5¼	68½	66
10 So. Amer. Republics	1565	1804	352	385	96	107	189	211	403	502
Percentage	100	100	22½	21½	6¼	6	12	11½	25¾	27¾
20 Latin Am. Republics	2128	2432	387	426	117	134	216	244	789	914
Percentage	100	100	18¼	17½	5½	5½	10¼	10	37	37½

	United Kingdom, Germany and France Combined			United States		
	1910-13	1924	1925	1910-13	1924	1925
20 Latin Am. Republics	700	720	804	302	789	914
Percentage	46	34	33	22	37	37½

Table showing the trade of Latin American republics and the percentages of this trade held by United Kingdom, France, Germany, and the United States.

Foreign Trade in Pacific Northwest

THE increased trade of the North Pacific with Europe is shown by the shipment of the Pacific Northwest last year of 2,882,000 bushels of wheat, 20,000,000 board feet of lumber, 1,500,000 bushels of apples, 128,000 barrels of flour, 7000 tons of canned salmon, 6000 tons of copper ingots. There were 190 sailings last year between North Pacific coast ports and Europe.

Since the fiscal year, 1925, there has been an increase in volume of intercoastal cargo passing through the Panama Canal from 9,715,442 tons to 10,862,402 tons for the fiscal year, 1927, the Panama Canal record points out. In the fiscal year, 1927, the westbound total was 2,822,598 tons and the eastbound total 8,039,804.

Preliminary returns for August show the Washington customs district again leads the Pacific Coast in the value of foreign trade moved through its ports, as compared with other customs districts.

The record of imports and exports for the various districts of the coast during August follows:

Imports

Washington	$25,252,305
San Francisco	17,127,465
Los Angeles	3,217,561
Oregon	1,187,260

Exports

San Francisco	$17,128,925
Washington	10,989,026
Los Angeles	8,575,269
Oregon	7,617,629

A consignment of 6,000,000 feet of lumber, largest straight lumber cargo sent from North Pacific ports to Europe, recently was lifted by the steamship Belpareil under charter to the Canadian-American Shipping Company, at the Columbia River and Puget Sound.

Photo by Swadley.

Bananas by Shipload

One of the important developments in San Francisco's foreign trade during 1927 was the establishment by the United Fruit Company of a direct line of steamers between Central America and San Francisco. Our illustration shows the first of these steamers, the Limon, pulling in to the United Fruit Company's dock at Fourth and Channel Streets, San Francisco.

It is expected that six such vessels will be placed on the run, these vessels being equipped to carry a limited number of passengers and large shipments of bananas and other fruits.

J. S. Rider will be operating manager for the United Fruit Company at San Francisco.

The American Packets

(Continued from Page 547)

and ordinary ability could soon get command. Courage and endurance were very important factors; to face the elements and contend with the crews required a nerve of steel, and an officer, as they used to say, that 'could not whip his weight in wild cats' was not wanted for a Liverpool packet ship. The cruelty practised on those ships, and generally sanctioned by the captains, was simply outrageous. The important thing was to make a passage, hence this sort of discipline was most popular to make this end. Some of the officers had what they called 'persuaders,' a stick about a yard long with a sharp nail projecting a half inch, and if the men did not move quickly enough, these persuaders were used in a most cruel manner. There were still other kinds of punishment, though not so severe.

"The crews were composed of many nations and sometimes classed as 'Buckos' and 'Renicks.' The first were the leaders of fights and all sorts of disorderly conduct, and a desperate lot of fellows they were too. The 'Renicks' were more docile, inexperienced in seamanship, and were controlled largely by the 'Buckos.'

"Handling sailors in those days was a problem, but handling several hundred emigrants in the winter months was equally bad. At times these latter were the rakings and scrapings of all Europe. Men, women, and children tumbled into the between decks together, dirty, saucy, and ignorant, breeding the most loathsome of creeping things. The stench below decks, aggravated by seasickness and the ship's poor equipment for the work, placed us far below the civilization of the Dark Ages. It was not uncommon in mid-winter to be 50 to 60 days making the homeward passage; in gales, which were frequent, hatches had to be battened down, and men, women, and children screamed all night in terror. Ship-fever, smallpox, and other contagious diseases were common, and it is a wonder that as many survived the voyage as really did. Rations were served out once a week in accordance with the British Government allowance—just enough to keep starvation away. The estimated cost to feed emigrants was twenty cents a head per day. The steerage passage rates were four pounds, and between passengers and freight money, the ships generally paid very good dividends.

"When leaving ports these ships were dressed with every flag in the code. The pier head was lined with friends bidding their last adieu, as with the steamers of today. The tug whistled, the moorings were cast off, the gun was fired, and the good ship was headed for her port of destination in charge of the pilot. The crew were called aft to the main capstan and lined up against the rail for watches to be chosen, while in the meantime a trusted man of the after guard rummaged the forecastle for liquor, and I will say right here, whiskey, from forecastle to cabin, was responsible for many of the tragic scenes of these packet ships, especially on leaving port.

"In the late fifties and early sixties, when the sailing ships and the few slow side-wheel and single screw steamers carried freight and passengers to and from Europe, the risk was large and the hardships great. Sailing ships in the winter months were frequently 40 and 50 days or more reaching New York, battered and torn. And steamships three and four thousand tons register were often two and three weeks making the passage in the same battered condition. At that time public confidence had not been established in their safety as seagoing vessels. Their machinery was often disabled and occasionally a shaft would break, leaving them almost helpless in the trough of the sea, hampered with a heavy screw dragging under the stern. They were compelled to make the nearest port in that disabled condition, under sail, which they were fully rigged to do, but at a great disadvantage over a sailing ship.

"In the last half century great progress has been made in new discoveries and improvements over the old, which has enabled the human race to accomplish great things, and I doubt if there is any industry where there has been greater advancement than in ships. Now a thirty thousand ton steamer of steel with two or more screws takes you to Europe in about five days, defies the tempest and the storm, gives you anything that can be found in a modern hotel, tells friends at home where you are every day, gets all the important news from shore as she reels the knots off at railroad speed, and all you have to fear is collision, and that risk is very much reduced by the more complete alarm signals, improved compartments, and the Marconi system of communication."

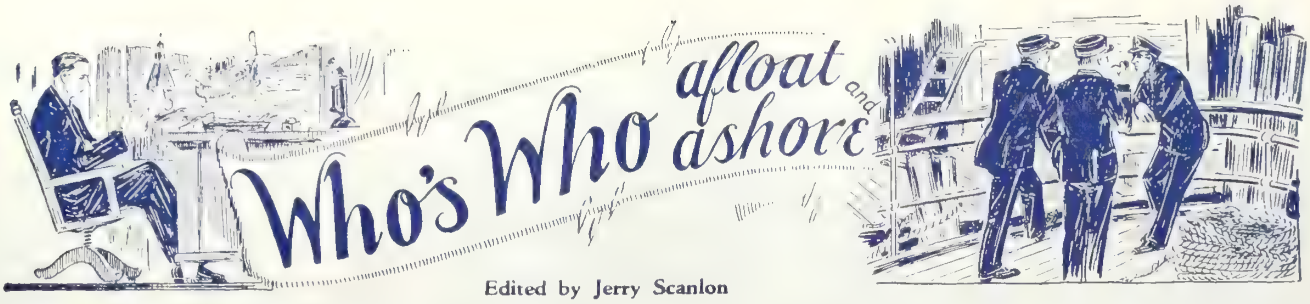
New Trade Frontiers

(Continued from Page 549.)

her former position, and in the past few years has sold large quantities of machinery, hardware and dyes in the Far East at prices which we do not care to meet, at the same time accepting credit risks which our merchants cannot properly assume. Whether or not Germany can continue that policy for long remains an open question.

There is some evidence that the trade lines of the future will knit the United States most closely with the relatively near-by countries of China and Japan, where we enjoy the advantage of proximity, as compared with the European nations, and where our progress is unimpeded by the preference of colonies for the goods of their mother countries. It is to Japan and China that we shall be shipping the major portion of our sales to the Orient, and our purchases from them promise to continue at a heavy rate. Our trade with more distant regions—regions nearer Europe—will always show an adverse trade balance, since we shall be the largest buyers of their produce, while our sales to them must compete with European products on terms somewhat disadvantageous to us.

Our task is to maintain our present rate of progress in penetrating the markets of the Far East. It is not an easy task, and it will take the best effort of our individual manufacturers and exporters, of our trade associations, and of our government agencies. Severe competitions will have to be met, our young men will have to go abroad to care for our interests, our merchants will have to invest their funds in new trade ventures. These things must be done if we are to cross successfully this new frontier of trade. The next few years, the next few decades, will determine in a large measure the lines of our future commerce with the world, and they deserve our best efforts.



Who's Who afloat and ashore

Edited by Jerry Scanlon

"Congress will provide substantially for perpetuation of the American merchant marine," is the prediction of **Admiral William S. Benson,** one-time chairman of the Shipping Board, now a member, who arrived in San Francisco on a general survey of Board activities and then proceeded to the Hawaiian Islands aboard the Matson liner Malolo. Continuing, he said: "Public opinion is exerting tremendous pressure against Congress for drastic action of some sort, and I find that sentiment is more than ripe in both houses. I consider the ten-year guarantee and its replacement feature essential to preservation of the American merchant marine, although under present conditions no operator could be blamed for hesitating to make a purchase offer."

Admiral Benson added that **Swayne & Hoyt,** operators of Shipping Board vessels, were outstanding managing agents as being among the best operators of Government tonnage on any ocean. He added:

"America's merchant marine is on the threshold of the biggest opportunity in its history, and, I believe, national sentiment has so strongly turned toward the sea that the next Congress will enact legislation that will put our flag back to its deserved position afloat."

Admiral Benson denied strongly that the Shipping Board has discriminated against the Pacific or displayed favoritism in its proposed sale of the remaining thirty-six freight steamers operated in transpacific trade by the Shipping Board. He declared, in fact, that more government-owned tonnage had been sold to Pacific operators since the close of the war than all other services and that the Shipping Board's proposed 10-year agreement plan of sale will insure the future of the American merchant marine.

Admirable William S. Benson, commissioner of the United States Shipping Board.

President P. A. S. Franklin, of the **International Mercantile Marine Company,** in a letter to stockholders, advised them that the I. M. M. has abandoned the plan for readjustment and reclassification of the share capital, following the issuance by the court of chancery of New Jersey of an injunction order restraining the management from proceeding with the original program.

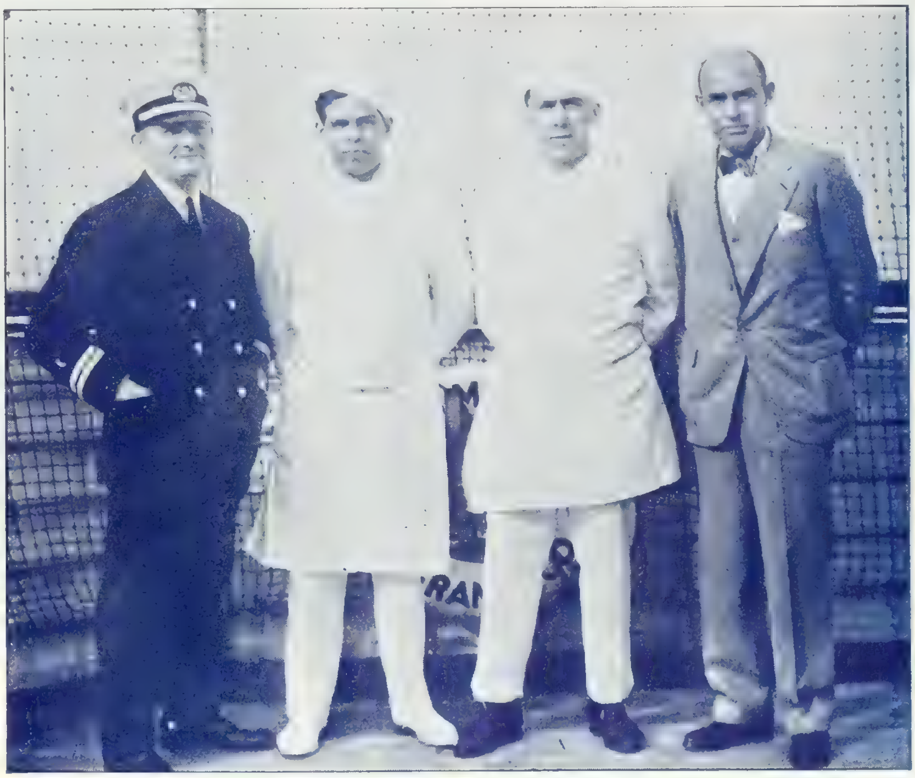
G. Hilmer Lunbeck, managing director of the **Swedish-American Line,** has advised the Pacific Coast offices that the company has invited European shipyards to submit tenders for the construction of a third passenger motor liner to be operated in the New York-Gothenburg service of the line.

Plans and specifications for the new motor liner have been complet-

Electric Cooking

The group at the right shows four men chiefly responsible for the electric cookery on the Malolo. Left to right: E. O. Fickendey, assistant chief steward; Hugo Weiderhoffer, chef; Ludwig Rice, assistant chef; and Grant Call, manager Hotel and Bakery Division, Edison Electric Appliance Company, Chicago.

These men used electric cooking equipment on the steamship Republic of the United States Lines and are now giving wonderful service with the equipment on the Malolo.



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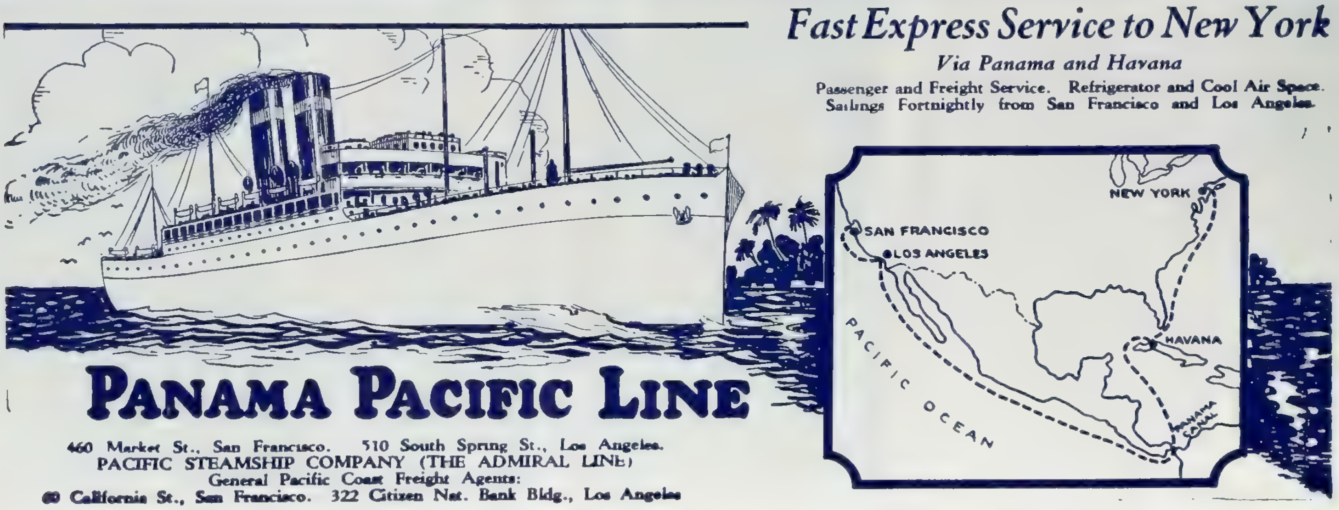

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ed, and it is expected the vessel will be ready in time to enter service late 1929 or early 1930.

Harry S. Scott, president of the **General Steamship Corporation,** who served as chairman of the Pacific Foreign Trade and Travel Exposition, which was held in San Francisco, November 11 to 20, said that the exposition was the most colorful event held since the Panama Pacific International exposition. Steamship lines serving the seven seas had colorful exhibits, among them being many fine models of some of the finest liners afloat. Close to 200,000 persons attended the Pacific Foreign Trade and Travel Exposition.

An increase in revenue shown in the report of the **Shipping Board's** comptroller for the current year to date has been received with gratification by government heads, according to **Ralph T. Johns,** district director in San Francisco.

The gross revenue for the year up to August 31 reached $67,981,161. Figures for the prior period in 1926 recorded $53,939,242. Operating expenses increased from $70,649,585 in 1926 to $81,332,352 for 1927.

Director Johns is in charge of the four shipping board tankers operating on the coast, all of which showed increased revenue.

J. Harry Mull, president William Cramp & Sons Ship and Engine Building Company, builders of the Malolo.

Chief Engineer E. D. Oesch, whose home is in Oakland, left the motorship M. F. Sterling at Dutch Island of Curacao, off the coast of Colombia, South America. Chief Engineer Oesch said that he quit the ship when Captain C. A. Watts, master, stated that he had no funds to pay the crew or provide food.

The American Consul provided funds for transportation of the crew to New York. The M. F. Sterling was en route from Seattle to South America, and cleared from the Puget Sound port with lumber last April. She is now reported to be en route back to Seattle.

Four officials of the Matson Navigation Company snapped on board the steamship Malolo. Left to right: William H. Sellander, general passenger manager; Peter Johnson, commodore of the Matson Fleet; William P. Roth, president; and A. C. Diericx, vice-president and general manager.

Captain Paul Grening, former master of the liner President Harding, has been appointed European director for the **Merchant Fleet Corporation.** Captain Grening has been making a survey of the Merchant Fleet Corporation's holdings in European ports since his appointment.

Matson Navigation Company officials who came around from New York aboard the **Malolo** included **William P. Roth,** president of the Matson Navigation Company; **A. C. Diericx,** vice-president and general manager; **E. D. Tenney,** chairman of the Board of Directors; and **William H. Sellander,** general passenger manager.

Joseph J. Tynan, vice-president of the Bethlehem Shipbuilding Corporation and general manager of the Union Plant, snapped on board the Malolo.

J. Harry Mull, president of the **gine Building Company** of Philadelphia, arrived at San Francisco on the Malolo. He stated that the Malolo was the finest ship ever built by Cramps, and that the $8,000,000 liner was second to none in the world. Mr. Mull spent most of his time in the engine room, wearing overalls, during the trip from New York, watching the performance of the giant liner's powerful propulsion system.

Joseph J. Tynan, vice-president of the Bethlehem Shipbuilding Corporation and general manager of the Union Plant, who returned to San Francisco from New York aboard the Malolo, stated that shipbuilding conditions on the Atlantic Coast were good, and that a general air of prosperity prevailed throughout

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the East. He stated that large reconditioning jobs on vessels were aiding materially in keeping the Eastern shipyard plants busy. During his visit he conferred with Charles M. Schwab, president of the Bethlehem Steel Corporation.

To inspect the offices and agencies of **W. R. Grace & Company** in the Spanish Americas, **Fred L.** Doelker, sub-manager, will be away from his office for three months. He sailed from San Francisco aboard the steamer Capac.

The San Francisco agency of the **Alaska Steamship Company** is now in charge of **H. C. Cantelow & Son,** who succeeded John W. Chapman. H. C. Cantelow & Son are also agents at San Francisco for the Canadian-American Shipping Company.

The Alaska Steamship Company operates a total of 20 vessels between Seattle and Alaska.

Washington advices quote Representative Martin B. Madden, chairman of the House Appropriations Committee, to the effect that additional land has been purchased at the Canal Zone and that $10,000,000 will be spent within three years for extra water supply permitting twice as many transits through the Canal as at present.

Leonard Everett, Far Eastern representative for **Swayne & Hoyt,** is en route to the Orient, after spending two months in the East and on the Pacific Coast.

Captain Cecil Brown, who has been ill for a year, has returned to San Francisco from his ranch at San Jose, completely recovered, and is now on 'Change again in the marine surveying business.

Captain George V. Richardson has been appointed commander of the **Panama-Pacific** liner Finland, having relieved **Captain James E. Roberts,** who has been assigned to the **Manchuria.** Captain Roberts succeeded **Captain H. A. T. Candy,** who has been assigned to the new liner **California.**

Other changes in the personnel of the Finland include **J. Orne Godwin** as purser, relieving **M. A. de Loch,** transferred to the Manchuria; **Frank B. Ingram,** succeeding **John Allen,** transferred to the Mongolia.

Dr. Patrick Burns, who has been ill for several months, arrived in San Francisco to enter the marine hospital.

A report states that while **Ernest Prince** may come to the Pacific Coast on the maiden voyage of the new liner California of the Panama-Pacific Line, as chief of the engine room, he will be relieved on the second voyage by **Harry Carstairs,** at present master of the propulsion department of the Atlantic liner Minnekahada.

Gossip says that Chief Engineer Prince, who was relieved from the liner Mongolia for the California, will remain shore-side as supervising engineer for the sister ship of the California, which will be under construction early next year.

William McStay was drafted by Henry Duffy, Pacific Coast theatrical producer, to handle the stage settings for the "Mystery Ship." The scenes included a deck scene and two staterooms. McStay, director of publicity for the Dollar Line, is an old-time theatrical publicity man. His efforts were warmly commended by maritime experts who witnessed the play at San Francisco.

Congressman Arthur M. Free of San Jose, California, a good friend of the American merchant marine.

Solution of the American merchant marine problem lies in the sale by the Shipping Board of all its ships, surrender of transport service by the army, and riddance of the Panama Transport Service, according to a resume of the situation by **Congressman Arthur M. Free,** of San Jose, California, just returned from Washington.

"By permitting the government to remain in the shipping business we have made it hazardous and difficult for the private American shipowner or operator to continue," he averred. "We can hardly expect the American business man to put his money into a business in which the government competes, nor to compete, without government aid, with foreign ships which have such aid," he added.

"In addition to the sale of government owned ships and discontinuance of transport service, let Congress grant, wherever necessary, that financial aid to shipowners and operators that other nations give, and we will get an American merchant marine which will put the United States in the position it merits on the sea. Seventy years ago we divided honors with Great Britain on the seas. Today, but for our coastwise trade, we would be in fourth or fifth place. Last year Italy and Germany outstripped us in shipbuilding. Small countries such as Norway, Spain, and Holland run us close in deep water commerce and our country is the richest in the world with a vast ocean-going commerce.

"To build up our status first we must become shipminded. We must educate the people to the nation's needs in ships to carry our goods to world marts as well as to defend us in time of need. Then we must make up for our restrictions on commerce. Having imposed on American owners and operators handicaps with which foreign lines are not compelled to comply, we have failed to provide assistance and awards to counterbalance such handicaps. I firmly believe in a strong American merchant marine, privately owned and operated. Private effort made America great on the sea and it can do so again," he concluded.

Speeding up of the westbound running time of **Arrow Line** vessels in the intercoastal trade has resulted in the previous passage time of the freighters being cut two days, according to **C. H. Chandler,** manager of the steamship department of **Sudden & Christenson,** Pacific Coast agents for the Arrow Line.

An announcement from Los Angeles stated that the **Associated Terminals** of San Francisco and the **Banning Stevedoring Company** of Los Angeles have purchased and will combine with the **International Stevedoring Company** of Seattle. **Gerald Fitzgerald** is the new president of the International Company. Other officers are **James V. Mason** and **Charles F. Tait,** vice-presidents; and **Fred Tuttle,** gen-

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eral manager. Offices of the company have been opened on the Grand Trunk dock at Seattle and in the Andrews Building in Tacoma. A Portland office will also be opened.

The International Stevedoring Company was founded in 1889. The late **Captain J. S. Gibson** was head of the firm for many years.

The **Matson** liners **Maui** and **Matsonia** are now laid up while undergoing extensive overhauling. The Maui will have her passenger accommodations refitted with hot and cold running water and beds will be installed instead of berths. Similar improvements will be made on the Matsonia. The Maui will be off the run until February 1, 1928, and the Matsonia will be out of service until January 18. The flagship **Malolo** will handle the business of the two ships while they are on drydock.

Alfred Jorgensen, formerly first officer aboard the Los Angeles Steamship Company's liner Yale for a short time, has been appointed port pilot at Los Angeles Harbor. **Robert Ritter** succeeded Jorgensen as chief officer of the Yale.

The port of **San Francisco** during the month of October experienced the greatest volume of business ever handled in its history, according to the Marine Department of the Chamber of Commerce. During the month 640 vessels, aggregating 1,547,983 net tons, arrived. There were 628 vessels departing and they aggregated 1,479,478 tons.

The highest prior record for the month of October was in 1925, when 612 ships aggregated an arrival of 1,419,321 tons. September of this year was a high month with 626 vessels of an aggregate tonnage of 1,437,000 departing.

The motor vessel Eurus of **Juneau,** which was believed lost in the waters off Southeastern Alaska, was found after a long search by the Coast Guard Cutter Unalga and towed to safe waters inside Cape Spencer.

Roy V. Crowder, passenger traffic manager of the Los Angeles Steamship Company, declared that business to the Hawaiian Islands this year has been gratifying, and that the traffic next year promises to surpass all records. Crowder returned to San Francisco after a three week's visit at the Islands, accompanied by **S. P. Trood,** advertising manager of the company. They made the voyage out of Los Angeles on the liner City of Los Angeles.

Officers and crew of the liner Sierra learned with regret of the passing of **Mrs. Alice M. Cavan,** stewardess of the vessel, following an illness of several weeks. Mrs. Cavan, one of the most popular stewards in the transoceanic run, died at Newman, California.

Captain H. R. Gillespie, master of the steamer **Lurline,** is a godfather. He assumed the role during a christening at sea of **Laura Lurline Clark,** infant daughter of Mr. and Mrs. E. E. Clark on the trip from Seattle to Honolulu. Clark is with the U.S. Naval Radio Service.

Captain C. A. Berndston, the new master of the Malolo, succeeding Commodore Peter Johnson, retired.

Arthur De Golia, assistant to **Herbert N. Thomas,** passenger manager of the Matson-Oceanic Line, is back at San Francisco from a three months' tour to the British Isles. He conferred with representatives of the company in England, Scotland, and Wales.

To study American steamship passenger methods, **John Peterson** of the Matson offices in Sydney is now in San Francisco on an extended stay.

Complete exoneration was given **Captain Bror W. Olson,** master of the steam schooner **Coos Bay,** which grounded in the Golden Gate at Lands End last October in a dense fog, by **Captain John K. Bulger,** U. S. Inspector of Hulls and Boilers. Captain Bulger commended Captain Olson for his fine seamanship in saving the lives of his crew and his action in refusing to leave the vessel until it was certain the ship was stuck fast on the rocks.

The **Panama Pacific** liner **California,** launched October 1, will make her maiden sailing on January 28 out of the harbor of New York. The giant carrier will route for Los Angeles and San Francisco for regular service. She will be in command of Captain H. A. T. Candy, former master of the Mongolia. Chief Engineer Edwin Prince, who was also with the Mongolia, will have charge of the liner's engine room.

The first unit of **Oakland's** $9,600,000 harbor bond issue program was officially dedicated November 5 with the opening of the Fourteenth Street Wharf on the western waterfront. The wharf was completed at a cost of approximately $500,000 and is 1021 feet long and 224 feet wide. The dedication exercises were headed by **LeRoy Goodrich,** former city commissioner; **G. B. Hegardt,** port commissioner; **Congressman Albert E. Carter,** and other officials.

The wharf is situated at the foot of Fourteenth street and a new paved highway leads to it. The shed of the wharf is 505 feet by 180 and has a 32 foot apron wharf. It also has a double spur track for the loading and unloading of cargo between land and water carriers. Spur tracks have also been laid on the landward side of the shed. The wharf and shed are of reinforced concrete and the shed is equipped with modern safety devices.

Negotiations are under way to build up the traffic for the new addition to the waterfront and also for the double pier under construction in the estuary at the foot of Grove street. The latter pier is expected to be ready for usage by February 1, according to Commissioner Hegardt.

A touching ceremony marked the casting of a letter written by the widow of the commander of the ill-fated Italian steamer **Principessa Mafalda** into the sea at the point where she sank. The letter, written by the widow of the commander, **Captain Simon Guly,** was carried on the steamer Duc D'Acosta, which sailed from Italy a few days after the Principessa Mafalda's departure from her native shores. After the tragic end of the steamer with the loss of more than 160 lives off the Brazilian coast, the master of

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And oft we've thought
thereafter
How he beat the storm to
laughter;
For, well he knew his
vessel
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the Duc D'Acosta cast into the waters the last letter written by the wife to her husband.

Port Engineer Joe Barker, of the Matson fleet, was presented with a "medal" by **Port Engineer Herman Gelhaus**, of **Swayne & Hoyt**, for his ability as being the worst duck hunter in the American Society of Marine Engineers. It seems that Port Engineer Barker has been treking to the duck ponds for a score of years with a hundred rounds of ammunition and heavy artillery, but nary a duck has he brought to earth.

"Well, anyway," soliloquized Barker, "my friends invite me to plenty of duck dinners, so why should I throw a "monkey wrench" into the duck fraternity."

Repairs of more than $228,198 are being carried out on the **United States Shipping Board** transatlantic liner **George Washington**, according to advices received here by **Mose H. Hunt**, Pacific Coast manager of the **United States Lines.** The George Washington will be ready to re-enter service on January 4, after being laid up since early November.

The **San Francisco Chamber of Commerce** was host to officials of the **United Fruit Company** following the arrival of the steamer **Limon**, which inaugurated the service from Port Limon, Costa Rica, to San Francisco in the banana carrying trade. Five vessels have been assigned to the service of the Fruit Dispatch Line, subsidiary of the United Fruit Company. Officials of the two companies entertained included **William Newsome**, senior vice-president, United Fruit Line; **Irving K. Ward**, president, Fruit Dispatch Company; **J. Scott Rider**, San Francisco division manager, United Fruit Line; **Louis M. Porter**, general traffic manager, United Fruit Line; **Harvey M.** Huff, Pacific Coast agent, United Fruit Line; and **L. W. Huse**, San Francisco United Fruit Company.

The last fiscal year registered a new high mark in **Panama Canal** traffic. A total of 6072 ships passed through the "Big Ditch" in constant procession, averaging 16.6 vessels in daily transit. Total net revenue from all sources, except operations of the Panama Railroad Steamship Line, was placed at $18,131,819 as compared to $17,340,865 the preceding year, Washington figures revealed.

Joseph P. Barker, port engineer, Matson Navigation Company, being decorated by Henry Gelhaus, port engineer of Swayne & Hoyt.

A trim "craft" was successfully launched at the San Diego home of **Commander Frank Johnson** of the **Lassco** liner **Yale**. The arrival was a 7-pound baby girl and she has been christened Barbara. The arrival marked the first in Skipper Johnson's family. When the Yale nosed her bow around Pier 7, the San Francisco berth of the company, a huge sign reading "Welcome, Papa," greeted the genial master of the Yale. There was a luncheon tendered Captain Johnson by San Francisco officials of the line in honor of the event.

Marine Repairs Inc., a subsidiary of the Bethlehem Shipbuilding Corporation and the Matson Navigation Company, has been organized and is now functioning in the Port Assessories Building of the Matson Company at Bryant and Main streets, San Francisco. Its officers are **Louis Siversen**, president; **George K. Nichols**, vice-president; **John E. Ryan**, secretary and treasurer.

The corporation was formed to do marine repair work and handle all engineering repairs for ships of the Matson fleet. It has an up-to-date plant with all equipment necessary to take care of marine repair jobs.

Captain Frank Johnson of the Lassco coastwise liner Yale.

A story marked with heroics during a heavy storm at sea was related by **Captain Wilbur A. Ross** of the Dollar liner President Adams upon return of the vessel from a round-the-world cruise. Captain Ross ordered the ship about when a sailing vessel was observed laboring in a crippled condition a day out of Havana. The Adams neared the crippled craft and effected rescue of the crew and the family of the captain with the aid of a small boat while a heavy sea was running.

The schooner **William A. Burnham** of Mobile, had been caught in a storm after leaving Trinidad 22 days prior. Battered by the heavy gale the craft sprung a leak and for fifteen days was kept from sinking only by valiant efforts of the crew, who worked day and night at the pumps. The crew of six men was aided in their apparently hopeless task by the wife and three children of the schooner's master, Captain A. Ryan.

Upon arrival and rescue by the President Adams, Captain Ryan's family and the crew were the first and the master last to leave the vessel. Captain Ross landed the entire party the day following at Cristobal.

Inauguration of a motorship freight and passenger carrying service in the spring between Pacific Coast ports and Germany via the Panama Canal, was announced by **Dr. Leisler Kiep**, director of passenger traffic of the **Hamburg-American Line.** Four motorships to be named after Pacific Coast ports, San Francisco, Los Angeles, Portland, and Seattle are under construction for the service.

Commodore Peter Johnson, veteran of the **Matson Navigation Company**, who has been with the company for thirty-five years, has retired. Commodore Johnson brought the Malolo out from New York on her maiden trip, and piloted the liner in her first two round voyages from San Francisco to Hawaii. His first command with the Matson company was in the brig **Lurline**, one of the first ships owned by the late William Matson, founder of the company. Commodore Johnson is one of the best known skippers sailing the Pacific.

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November 15, 1927.

THE following steamers are reported fixed with grain from the North Pacific to U. K.-Continent: British str. King Bleddyn, 33/-, Dec./Jan., option Prince Rupert 34/-; British str. Koranton, 32/-, Feb., Strauss & Co.; "K" Line steamer, 32/-, Dec., same charterers; a steamer, 32/6, Dec./Jan., Heatley & Co.; British steamer Kinross, 32/6, Dec. / Jan., same charterers; British str. Trekiene, 33/-, Dec./Jan.; a steamer, 33/-, Dec./Jan., Mitchell & Co.; British str. Ashworth, 33/-, Dec.; British str. Jersey City, 32/3, Jan., Heatley & Co.; "K" Line steamer, option Antwerp and Rotterdam, 32/9, Dec., Wm. H. Pim, Jr.; British str. Wentworth, 33/-, Dec., Heatley & Co.; Court steamer, 33/-, Dec./Jan., Balfour Guthrie & Co.; British str. Benvorlich, 33/3, option Antwerp-Rotterdam, 32/9, Dec.; British str. Blythmoor, 33/-, Dec./Jan.; British str. Innerton, 32/6, Dec.; British str. King Edward, 32/6, Dec.; British str. Lenfield, 33/-, Dec./Jan., Kerr Gifford & Co.; British str. Seapool, Dec.; British str. Skegness, 33/-, Dec., Wm. H. Pim, Jr.; British str. Warkworth, 33/6, Dec., Kerr Gifford & Co.; Br. str. Treverbyn, 35/-, Balfour Guthrie & Co.; British str. Ainderby, Dec.; a steamer, 32/6, Dec./Jan.; British str. Dalblair, 31/-, Nov., Heatley & Co.; British str. Newbrough, 32/7½, Heatley & Co.; three Ropner steamers, 32/6; British str. Trevethoe, 33/-, Dec., Kerr Gifford & Co.; British str. Trefusis, Dec., same charterers; British str. Foyle, 33/-, Dec./Jan., James Stewart Grain Corp.; British str. Pearlmoor, 35/-, Nov., Strauss & Co.; a steamer, 32/6, option Antwerp or Rotterdam, 32/-, Jan.; British str. Beechpark, 32/6, Dec.; British steamer Hedgehope, 32/6, Dec./Jan.; Japanese str., 31/7½, Jan., Wm. H. Pim, Jr.; British str. Salmonpool, Dec.; two Tre steamers, 33/-, Antwerp or Rotterdam, 32/6, Dec./Jan.; British str. Paris City, Nov., Kerr Gifford & Co.; British str. Uganda,, 33/-, Dec./Jan., Antwerp or Rotterdam 3/- less; British str. Stagpool, Dec.; British str. Cape Cornwall, London and Rotterdam, Dec., Canadian American Shipping Co.; British m.s. Vinemoor, Puget Sound to Mediterranean, 34/6, Nov./Dec.; British str. Barrhill, Antwerp and Rotterdam, 32/6, Dec., Strauss & Co.; British str. Dalemoor, Vancouver to Antwerp or Rotterdam, 32/-, Dec./Jan.; British str. Hazelwood, Hamburg, Dec., Canadian American Shipping Co.; British str. Romanby, Antwerp or Rotterdam, 32/-, Dec., option Hamburg, 32/6; Italian m.s. Ansaldo San Giorgio Terzo, Antwerp or Rotterdam, 31/9, Dec.; a steamer, Antwerp or Rotterdam, 32/6 less 3½%, Dec.; British str. Waziristan, Antwerp or Rotterdam, 32/6, Dec./Jan., Hamburg 32/-, Wm. H. Pim, Jr.

The Japanese str. Toyohiko Maru is reported fixed with lumber from Columbia River to Australia, Dec. loading, by Balfour, Guthrie & Co.

The American str. Cerro Gardo is reported fixed with lumber from British Columbia to Japan by W. L. Comyn and Co.

The American str. S. A. Perkins is reported fixed from the North Pacific to West Coast of South America with lumber and merchandise by Winge & Company, Dec. loading.

The Danish m.s. Nicoline Maersk is reported fixed with lumber from British Columbia to North of Hatteras, Oct./Nov. loading, by Strange & Company, and the American str. Onondaga is reported fixed from Puget Sound to New York, Nov. loading.

The Japanese str. Ryoka Maru is reported fixed with gypsum rock from San Marcos Island to China, Dec. loading by Standard Gypsum Co., Inc.

The following time charters are reported: Norwegian str. Samnanger, one round trip intercoastal, delivery Cornerbrook, N.F., prompt, redelivery North of Hatteras, $1.12½, Canadian Transport Co.; British str. Queen Olga, Pacific trade, 5 months, delivery Gulf., Nov.; Norwegian str. Hampholm, North Pacific to South Africa, $1.05; Dec., J. J. Moore & Co.

The following tanker fixtures are reported: British str. Oleander, California to Japan, 85c ,Nov.; British str. Lunula, California to U. K.-Continent, 26/- one, 27/- two, Nov.-Dec.; British str. Oilshipper, California to U. K.-Continent, 26/-, November.

The American str. West Erral is reported sold from Pillsbury & Curtis to Los Angeles Steamship Co.

PAGE BROTHERS, Brokers.

Diesel Cylinder Lubrication

(Continued from Page 569)

plugged with carbon. The lubricating oil from the lubricator would follow the lines of least resistance and pass out through the other two lubricating orifices on the opposite side of the cylinder, as only one lubricator plunger served the four feeds. As the piston was short and no check valves were placed close to the liner surface, part of the lubricating oil would squirt out on to the piston rod and down into the drain pan after the piston uncovered the orifices. Under this condition one side was robbed of lubrication and the other side was spilling its surplus into the drain pan. Due to the fact that the grooves in the piston uncovered spongy matter, the sides of the ring groove were badly worn. The influence of the resultant pressure exercised behind the rings, as illustrated in Figure 3, page 467 of the October issue of Pacific Marine Review, caused the piston rings to assume a condition as shown in Figure 3, (somewhat exaggerated).

The friction of the gummy cylinder walls naturally aggravated the tilting action on the piston rings. One piston ring in one of the cylinders was made of a very poor cast iron of very open structure and low in tensile strength. This ring broke and one corner was wedged into the liner wall on the up or compression stroke. This piece of broken ring locked the piston within the bore and as the other cylinders were providing power to rotate the crank, the crosshead was forced out of its guide and the general effect illustrated in Figure 2 by dotted lines resulted.

A number of changes to improve the conditions on this engine will readily suggest themselves after consideration of the facts outlined above. Suffice it to say, however, that as long as elastic piston rings ride on a film of proper lubricant the maintenance record will show economical operation.

The Winslow Marine Railway and Shipbuilding Company of Eagle Harbor, Seattle, has had very little new work the past season, but the yard has been kept fairly busy on general repairs. The company operates a 3000-ton railway in connection with a most complete yard.

European Inland Waterways Development

(Continued from Page 559)

"These navigable waterways fill still another purpose. By their presence alone they moderate the freight rates which the railways impose. They are to the railway operator a notice not to pass the limit beyond which the business man would not hesitate to sacrifice regularity to economy. In this respect navigable routes are much more efficacious than competing railways; for the railways by the fact that they compete with one another with the same weapons, end generally by reaching an agreement rather than by involving themselves in inevitable ruin, while services by boats and by rail distribute among themselves naturally the traffic which is more appropriate for each of them."

The de Freycinet legislation of 1878-1879 abolished tolls on French waterways. However, in 1903, France adopted the policy of requiring cities, localities, and chambers of commerce to contribute to the cost of new construction from which they would derive benefit.

As a result of this comprehensive policy, during the calendar year 1926, the internal waterway system of France carried 39,069,000 metric tons of freight, an amount only 7 per cent. less than the 42,039,000 metric tons carried in 1913. In 1880, the water-borne tonnage was one-fifth that of the railways; but, in 1913, the waterway traffic had increased so that it was equal to one-fourth that of the rail movement. Freight rates are not fixed by the French government on water transportation as on rail transportation, but the rail rates, as a rule, are so adjusted that they will be about 20 per cent. above rates on the waterways.

Britain

In contrast to the French policy, we find that the English have allowed their waterways to fall largely into disuse. While Britain never had great waterway systems such as exist on the continent, nevertheless, inland waterway transportation was formerly quite a factor. This neglect of the waterways, however, does not go on unprotested, for many are the demands upon the government to extend its aid in their restoration; and many are the letters written to the "Manchester Guardian" and the "London Times" lamenting the past glories of their waterways and placing them in the same category as England's lost peasantry which, in the words of Goldsmith, were:

" . . . . their country's pride,
Once destroyed, can never be supplied."

Aside from the emotional aspect, the cold economic truth is that England is suffering for the lack of this cheap form of transportation, and, in its absence, is paying the penalty in excessive rail rates.

League of Nations

The nations of Europe, generally, are keenly alive to the importance of inland navigation; this is evidenced by the fact that the first big task of the Committee for Communications and Transit of the League of Nations was in inquiry into the present position of inland navigation in Europe, with particular reference to the Rhine and the Danube, from the technical and, more particularly, from the commercial and administrative point of view. Incidentally, this work was entrusted to an American, Walker D. Hines, and was reported to the League in August, 1925. These two reports reiterate in most emphatic manner the importance of inland waterway navigation as factors in port development and national prosperity.

German Railroads Vs. Rhine

No discussion of the present waterway situation in Europe would be complete without reference to a peculiar situation that exists in Germany and which is causing intense dissatisfaction in the Rhine region as well as in the Netherlands, Belgium, and France. This is the fact that interests in charge of German railways are using them to build up the ports of Hamburg and Bremen, thus deliberately sacrificing the interests of the Rhine region to accomplish this end. Hamburg and Bremen seem to have been made, to an increasing extent, the beneficiaries of a policy of exceedingly low rail rates to attract commerce to those ports. On the other hand, the special rail tariffs which before the war had operated to encourage the movement of traffic through Rhine river ports have been largely discontinued, this being influenced by the fact that since 1920 (when the State railways were transferred to the Reich), there have been no separate administrations for the Bavarian and the Baden railways. These, as separate systems, had had a direct interest to encourage the joint movement of traffic by their respective lines and the Rhine. In addition, the Reich, in 1920, introduced a new railway tariff system which operated to make comparatively low rates for long distances and comparatively high rates for short distances. This change has had the effect of making the important rail rates to and from the Rhine river ports relatively higher than before the war.

Each of these two policies has operated to cut down materially the Rhine navigation's hinterland both for incoming and outgoing traffic. The resulting impairment of Rhine traffic has caused the liveliest concern and the most earnest protests on the part of the Rhine shipping interests and commercial agencies. The situation has become more complicated because, it is asserted, French and Belgian railways have retaliated by introducing exceedingly low rates to protect the port traffic of Antwerp and French ports and direct as much as possible of the Swiss traffic to an all-rail route. Peculiarly enough, it has been pointed out that the railroads have not benefited by these proceedings for the resultant traffic is being handled at a loss.

The situation became so acute that, in October, 1926, an extended pooling of Rhine River shipping interests was effected. It is hoped that this will introduce sufficient co-operative methods of efficiency and economy to enable the waterway lines to exist.

Conclusion

In conclusion, it is apparent that European transportation practice offers a veritable mine of information that should be explored as an aid to the solution of many of our pressing economic problems. We can deduce readily from this European experience that:

1. Waterways are a great source of national prosperity.

2. They are a vital part of any national transportation system.

3. Waterways must be safeguarded and coordinated with other transportation media.

Nowhere in the world has Providence been more beneficent in water resources than in America. In our Great Lakes and Mississippi systems we have opportunities for development beyond the fondest dreams of any European operator. In this domain we have lying before us the key to the solution of many of our greatest agricultural and industrial problems. We would be sadly remiss if we failed to profit by this most illuminating European experience.